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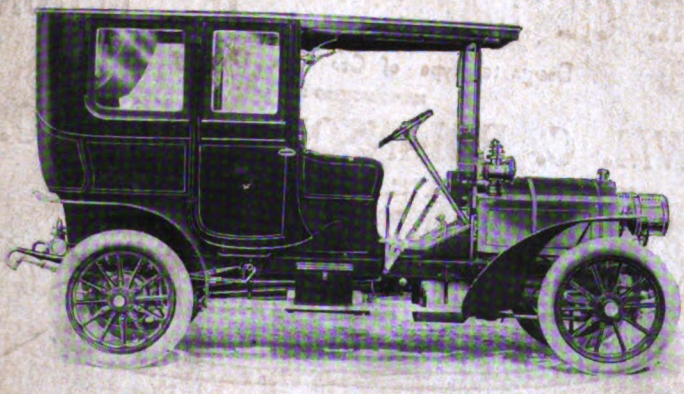

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PUBLICATION OFFICE:
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ROBERT WOLFERS, *Manager*

WESTERN OFFICE:
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IN compiling this Directory we have included all the available names of American manufacturers of complete automobiles, commercial vehicles, motor boats and motor cycles, and of all makers of parts and accessories.

Manufacturers' names are classified under the headings of the various products, and the classifications are completely indexed. We will consider it a favor if manufacturers will notify us at once in case their names are not included in the Directory, or the information given is in any way incorrect or incomplete, as it is our intention to make the Directory of unquestionable accuracy.

For the convenience of mechanical engineers and purchasing agents we have incorporated a department under the heading "Tables and Data for Engineers." This information has been compiled from authoritative sources with a view to its usefulness to those actively engaged in the automobile industry. In subsequent editions additional tables and data will be included and any suggestions or data which will make this department more valuable and which our readers may favor us with will be appreciably received.

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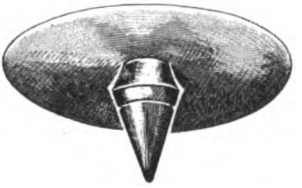

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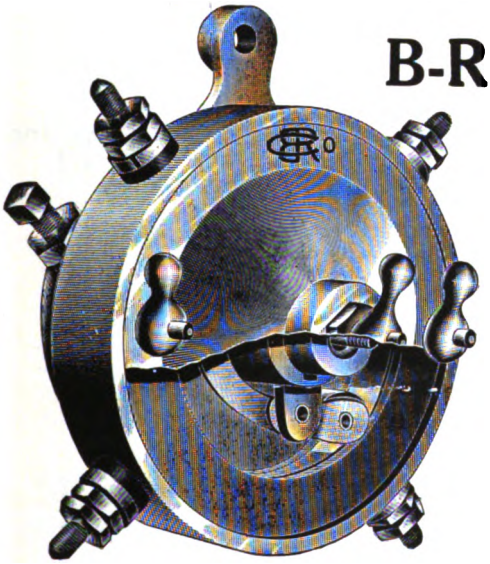
MOTOR SUPPLIES

ALL LEADING MAKES



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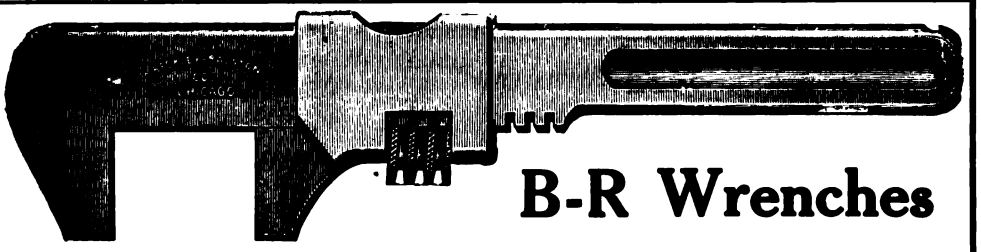

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DRAGON Automobile Co., 30th and Chestnut Sts., Philadelphia, Pa.

DURYEA Power Co., Reading, Pa.

EAGLE Automobile Co., Rahway, N. J.

EISENHUTH Horseless Vehicle Co., Middletown, Conn.

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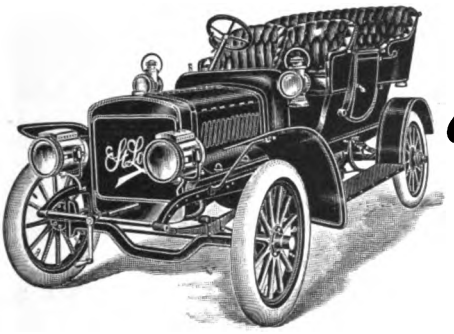

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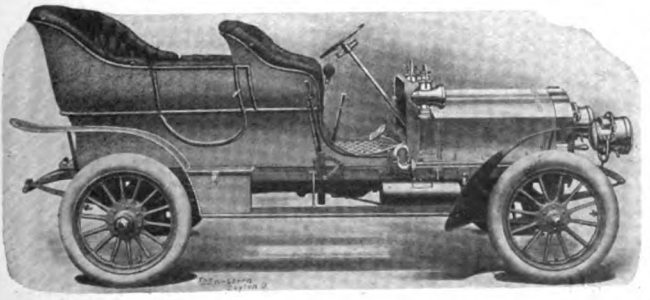

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PIERCE Engine Co., Racine Junction, Wis.

PIERCE, The Geo. N. Co., 6-22 Hanover St., Buffalo, N. Y.

POPE Motor Car Co., Hartford, Conn. (see page 91).

POPE Mfg. Co., Hagerstown, Md.

POPE Motor Car Co., Toledo, O.

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PRACTICAL Automobile Co., Genoa, Ill.

PREMIER Motor Mfg. Co., Indianapolis, Ind.

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SUCCESS Auto-Buggy Mfg. Co., 532 De Ballivere Ave., St. Louis, Mo.

SUNSET Automobile Co., San Francisco, Cal.

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DAIMLER Mfg. Co., 959 Steinway Ave., Long Island City, N. Y.

DEERE-Clark Motor Car Co., Moline, Ill.

DURYEA Power Co., Reading, Pa.

EISENHUTH Horseless Vehicle Co., Middletown, Conn.

EMPIRE State Engineering Works, 555 E. 116th St., New York City.

FOUR Wheel Drive Wagon Co., 3211 Vliet St., Milwaukee, Wis.

GAETH Automobile Works, Cleveland, O.

HAMBRICK Motor Car Co., Washington, Ind.

HEWITT Motor Co., 10 E. 31st St., N. Y. City.

HINDE & Dauch, Sandusky, O.

HUBER Auto Co., Atwater and Antoine Sts., Detroit, Mich.

IROQUOIS Iron Works, Buffalo, N. Y.

JEFFERY & Co., Thos. B., Kenosha, Wis.

KANSAS City Motor Car Co., Sheffield, Mo.

KARBACH Automobile & Vehicle Co., Omaha, Neb.

KNOX Automobile Co., Springfield, Mass.

KNOX Motor Truck Co., Springfield, Mass. (see page opposite).

LEAR Automobile Co., Oscar, Columbus, O.

LOGAN Construction Co., Chillicothe, O.

MACK Bros. Motor Car Co., Allentown, Pa.

MARION Motor Car Co., Indianapolis, Ind.

MATHESON Motor Car Co., Wilkesbarre, Pa.

MAXWELL-Briscoe Motor Co., Tarrytown, N. Y.

McNAUGHTON Co., Jas., Mutual Life Bldg., Buffalo, N. Y.

MEISELBACH Motor Wagon Co., North Milwaukee, Wis.

MILLER Garage Co., Inc., Bridgeport, Conn.

MITCHELL Motor Car Co., Racine, Wis.

MODEL Gas Engine Works, Peru, Ind.

MOTORCAR Co., Detroit, Mich.

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NORTHERN Motor Car Co., Detroit, Mich.

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PACKARD Motor Car Co., Detroit, Mich.

PONTIAC Motor Car Co., Pontiac, Mich.

POPE Motor Car Co., Hartford, Conn.

PREMIER Motor Mfg. Co., Indianapolis, Ind.

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BRUNN'S Carriage Manufactory, 1140-1148 Main St., Buffalo, N. Y.

CANTONO Electric Tractor Co., 111 West 37th St., New York.

COLUMBUS Buggy Co., Columbus, O.

ELECTRIC Vehicle Co., Hartford, Conn.

ELECTRIC Vehicle Equipment Co., 20th and Montgomery Ave., Philadelphia, Pa.

GENERAL Vehicle Co., Borden and Review Aves., Long Island City, N. Y.

HOLSON Motor Patents Co., Ltd., Grand Rapids, Mich.

LANSDEN Co. (The), 54 Lackawanna Ave., Newark, N. J.

NATIONAL Motor Vehicle Co., 2100 E. 22nd St., Indianapolis, Ind.

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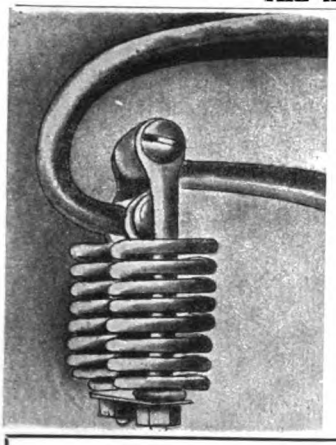

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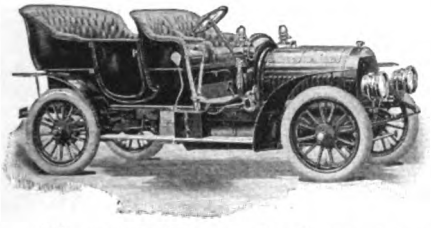

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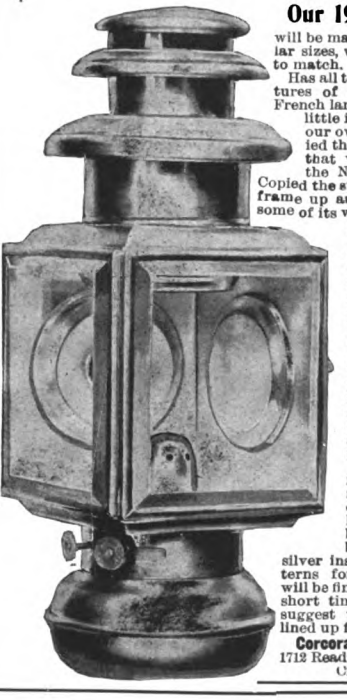

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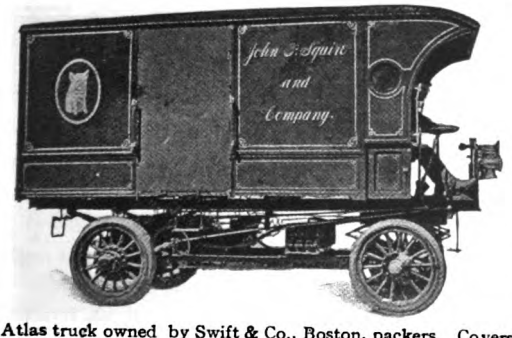

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Atlas

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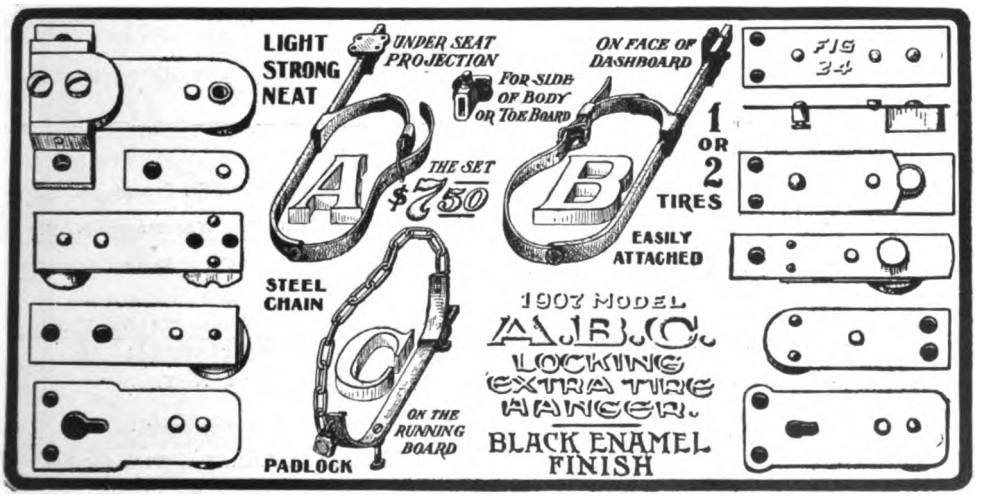

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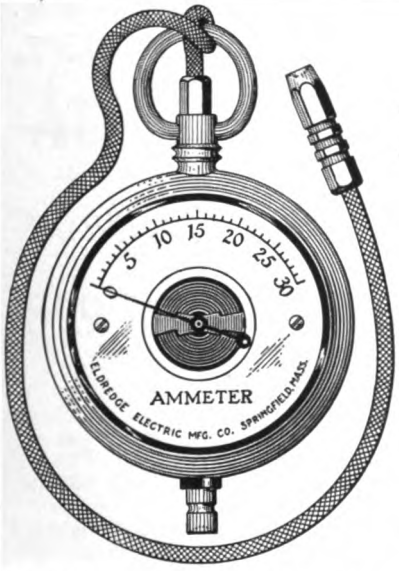

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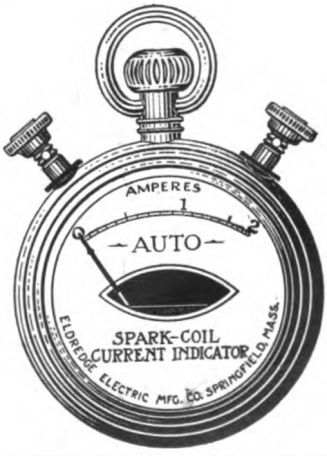

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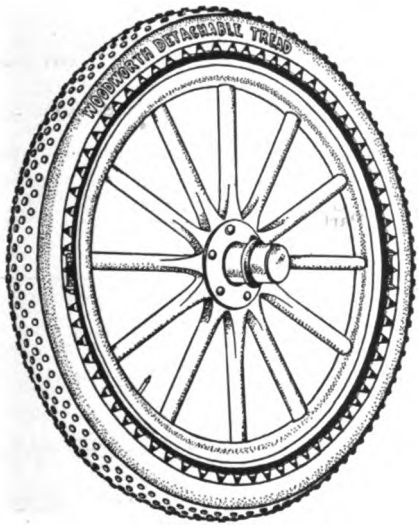

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SALISBURY Wheel & Mfg. Co., Jamestown, N. Y. (see page 167).

SMITH Co., A. O., Milwaukee, Wis.

STANDARD Roller Bearing Co., 48th St. and Girard Ave., Philadelphia, Pa.

TIMKEN Roller Bearing Axle Co., Canton, O.

WEBSTER Mfg. Co., 1075 West 15th St., Chicago, Ill.

WESTON-Mott Co., Flint, Mich., and Utica, N. Y.

BALLS (Steel)

AMERICAN Ball Bearing Co., Cleveland, O.

AMERICAN Ball Co., Eagle St. and Kingsley Ave., Providence, R. I.

BOSTON Gear Works, Norfolk Downs, Mass.

EXCELSIOR Machine Co., Military Road, Buffalo, N. Y.

JONES & Co., E. J., Arlington Heights, Mass.

STANDARD Roller Bearing Co., Philadelphia, Pa.

STEEL Ball Co., 832-840 Austin Ave., Chicago, Ill.

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BALL RETAINERS

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 99).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

SARTUS Ball Bearing Co., 155 Spring St., N. Y. City.

STAR BALL Retainer Co., Lancaster, Pa.

BASKETS, HAMPERS AND TOURING CASES (See Hampers)

BATTERY BOXES

HAYES Mfg. Co., 360-370 Maybury Ave., Detroit, Mich. (see page 119).

JACKSON Mfg. Co., 614 17th St., Denver, Colo.

BATTERY CONNECTIONS (See Wire Terminals)

BATTERIES (Primary)

ALPHA Dry Battery Co., 28 Cortlandt St., New York.

AMERICAN Battery Co., 170-172 S. Clinton St., Chicago, Ill.

AMERICAN Coil Co., Foxboro, Mass.

AMERICAN Electric Novelty Co., 308 Hudson St., N. Y. City.

BURNLEY Battery Co., Painesville, O.

CENTRAL Electric Mfg. Co., 1525 Second Ave., Rock Island, Ill.

COLUMBIA Dry Battery Co., 220 B'way, N. Y. City.

CONN. Telephone & Electric Co., Meriden, Conn.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 41).

DELTA Mfg. Co., Bloomfield, N. J.

DOW Portable Electric Co. (The), Braintree, Mass.

EASTERN Carbon Wks., W. Bergen, Jersey City, N. J.

EDISON Mfg. Co., Orange, N. J.

ELECTRIC Contract Co., 202 Centre St., N. Y. City.

ELECTRIC Storage Battery Co., Philadelphia, Pa.

EXCELSIOR Dry Battery Co., 34 Vesey St., New York City.

FORTO Electric Co., 52 Water St., N. Y. City.

FRENCH Battery Co., Madison, Wis.

GORDON Battery Co., 439-445 E. 144th St., N. Y. City.

MANHATTAN Electrical Supply Co., 17 Park Place, New York.

NATIONAL Carbon Co., Cleveland, O. (see page 67).

NEW Excelsior Dry Battery Co., 32 Vesey St., N. Y. City.

NON-POLARIZING Co., 28 Broome St., New York City.

NOVELTY Electric Co., Philadelphia, Pa.

NUNGESSER Electric Battery Co. (The), 21 King St., Cleveland, O.

ROCHE, Wm., 52-54 Park Place, N. Y. City.

ROCK Island Battery Co., Cincinnati, O.

ROYAL Battery Co., 143 Chambers St., N. Y. City (see page 7).

SEMI-DRY Battery Co. (The), 5th and Essex Sts., Harrison, N. J.

SWAN Elec. Co., 21 State St., New York, N. Y.

U. S. Battery Co., New Rochelle, N. Y.

WESCO Supply Co. (The), 7th St. and Clark Ave., St. Louis, Mo.

WILHELM Battery Co., The H., 70-72 Frost St., Brooklyn, N. Y.

BATTERIES (Storage)

AMERICAN Battery Co., 172 South Clinton St., Chicago, Ill.

AUTOMOBILE Parts & Equipment Co., 2228 Michigan Ave., Chicago, Ill. (see page 147).

BADT-Goltz Engineering Co., 1504 Monadnock Bldg., Chicago, Ill.

BATTERY Power Co., 247-253 Madison St., Milwaukee, Wis.

CHICAGO Battery Co., Michigan Ave. and 14th St., Chicago, Ill. (see page 181).

CLARK, A. F. & Co., 2130 W. Susquehanna Ave., Philadelphia, Pa.

COLUMBUS Storage Battery Co., Columbus, Ohio.

CROFTON Storage Battery Co., Toronto, Canada.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 41).

DAYTON Mfg. Co., 2240 E. 3d St., Dayton, O.

DELTA Mfg. Co., Bloomfield, N. J.

EDISON Storage Battery Co., Orange, N. J.

ELECTRIC Storage Battery Co. (The), Allegheny Ave. and 19th St., Philadelphia, Pa.

ELECTRIC Vehicle & Supply Co., 4th and Prairie Sts., Milwaukee, Wis.

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EMPIRE Storage Battery Co., 42 E. 23d St., N. Y. City.

EVANSVILLE Battery & Electrical Co., Evansville, Ind.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

G. & C. Dry Battery Mfg. Co., 57 W. 3d St., N. Y. City.

GENERAL Accumulator & Battery Co., 142 2d St., Milwaukee, Wis.

GOULD Storage Battery Co., 25 West 33d St., N. Y. City.

HASCHKE Compound Storage Battery Co., 89 Ashland Blvd., Chicago, Ill.

HATCH Accumulator Co., Charlestown, Boston, Mass.

HELIOS Mfg. Co., Bridesburg, Pa.

HERZ & Co., 203-205 Lafayette St., New York (Importers).

KITSEE Storage Battery Co. (The), Wilkes-Barre, Pa.

LOOK Electric Co. (The), 1545 Michigan Ave., Chicago, Ill.

MACRAE, Hector, 316 St. Paul St., Baltimore, Md.

MICHIGAN Storage Battery Co., 24 Atwater St., E., Detroit, Mich.

NATIONAL Battery Co., 268-282 Mass. Ave., Buffalo, N. Y. (see page 33).

NEW England Motor Co. (The), Liberty Square, Lowell, Mass. (see page 33).

NORTHWESTERN Storage Battery Co., Stephenson Bldg., Milwaukee, Wis.

PERRETT Storage Battery Co., 17 State St., N. Y. City.

PHILADELPHIA Storage Battery Co., Emerald and Tioga Sts., Philadelphia, Pa.

PILE Bloc Co., 253 B'way, New York.

ROYAL Battery Co., 143 Chambers St., N. Y. City (see page 7).

RUBAY, Leon, 136 West 38th St., N. Y. City (Importer).

RUCKERT, G. R., 13 E. 39th St., N. Y. City.

RUPRECHT Electrical Co., 769 Cedar Ave., Cleveland, O.

SMITH Storage Battery Co., 198 State St., Binghamton, N. Y.

STORAGE Battery Supply Co., 239 East 27th St., N. Y. City.

TOLEDO Storage Battery & Elec. Co., 102 Ottawa St., Toledo, O.

TRAY Plate Battery Co. (The), 5 Frederick St., Binghamton, N. Y.

U. S. Battery Co. (The), New Rochelle, N. Y.

UNIVERSAL Elec. Storage Battery Co., Stock Exchange Bldg., Chicago, Ill.

VESTA Accumulator Co., 1334 Michigan Ave., Chicago, Ill.

WESTERN Storage Battery Co., Indianapolis, Ind.

WILLARD Storage Battery Co. (The), Cleveland, O.

WITHERBEE Igniter Co., 541 West 43d St., N. Y. City (see page 183).

BEARINGS (Ball)

AMERICAN Ball Co., Providence, R. I.

AMERICAN Ball Bearing Co., Cleveland, O.

AUBURN Ball Bearing Co., Rochester, N. Y.

BANTAM Anti-Friction Co., Bantam, Conn.

CHAPMAN Double Ball Bearing Co., Sudbury St., Boston, Mass.

HESS-Bright Mfg. Co., 245 N. Broad St., Philadelphia, Pa.

LEE & Porter, Buchanan, Mich.

PENNSYLVANIA Ball & Roller Bearing Co., Girard, Pa.

PRESSED Steel Mfg. Co., 545 The Bourse, Philadelphia, Pa.

RUBAY, Leon (Importer), 140 West 38th St., N. Y. City.

SARTUS Ball Bearing Co., 155 Spring St., N. Y. City.

STANDARD Roller Bearing Co., 48th St. and Girard Ave., Philadelphia, Pa.

STAR Ball Bearing Axle Co., Princeton, Ill.

WORCESTER Pressed Steel Co., Worcester, Mass.

BEARINGS (Bronze)

ADVANCE Mfg. Co., Kalamazoo, Mich.

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page 51).

BRIDGEPORT Deoxidized Bronze & Metal Co., Bridgeport, Conn.

BUDA Fdry. & Mfg. Co., Chicago, Ill.

CHAPMAN & Co., J. B., 51 Taylor St., Springfield, Mass.

CLARK, John W., Albany, N. Y.

CRAMP, Wm. & Sons, Ship & Engine Building Co., Philadelphia, Pa.

HOMER Brass Works, Inc., 231 Race St., Philadelphia, Pa.

LIGHT Mfg. & Fdry. Co., Pottstown, Pa.

MENCHEN Electrical Co., Joseph, 354 West 50th St., N. Y. City (see page 87).

MICHIGAN Brass Mfg. Co. (The), 74-78 Fort St., E., Detroit, Mich.

NIAGARA Falls Brass Works, Inc., Niagara and Virginia Sts., Buffalo, N. Y. (see page 55).

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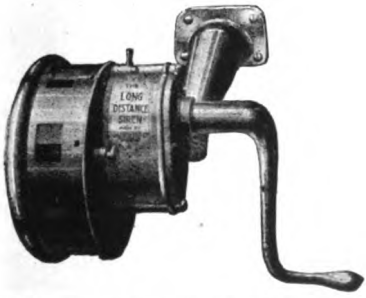

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PROVIDENCE Brass Fdry. & Mach. Co., Providence, R. I.

REEVES & Son, Paul S., 1415 Catharine St., Philadelphia, Pa.

SYRACUSE Aluminum & Bronze Co., Syracuse, N. Y. (see page 53).

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

BEARINGS (Roller)

AMERICAN Roller Bearing Co., South Framingham, Mass.

CONCORD Axle Co., 26 Crescent St., Penacook, N. H.

HYATT Roller Bearing Co., 427 Middlesex St., Harrison, N. J.

MOFFETT Vehicle Bearing Co., 922 S. Niagara St., Saginaw, Mich.

PENNSYLVANIA Ball & Roller Bearing Co., Girard, Pa.

STANDARD Roller Bearing Co., Girard Ave. and 48th St., Philadelphia, Pa.

TIMKEN Roller Bearing Axle Co., Canton, Ohio.

BELLS

ANSONIA Electrical Co., Ansonia, Conn.

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

BEVIN Bros. Mfg. Co., East Hampton, Conn.

BRIDGEPORT Brass Co., Bridgeport, Conn.

COLE & Son, Rockford, Ill.

EAST Hampton Bell Co. (The), East Hampton, Conn.

EDWARDS & Co., 405 E. 144th St., N. Y. City.

GONG Bell Mfg. Co., East Hampton, Conn.

HILL, N. N., Brass Co., East Hampton, Conn.

HOLTZER-Cabot Electric Co., Brookline, Mass.

LIBERTY Bell Co., Bristol, Conn.

MOSSBERG, Frank, Co., Attleboro, Mass.

NEW Departure Mfg. Co., Bristol, Conn.

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

PROCTOR-Raymond Mfg. Co., Detroit, Mich.

BODIES (Wood and Metallic)

ABRESCH Co., Charles, 398 4th St., Milwaukee, Wis.

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J. (see page 17).

ARMSTRONG, M., & Co., 433 Chapel St., New Haven, Conn.

AUTO Body Co. (The), Franklin Ave., Lansing, Mich.

AUTO Body and Finishing Co., Amesbury, Mass.

BABCOCK Co., H. H., Watertown, N. Y.

BARNDT-Johnston Auto Supply Co. (The), Columbus, O.

BIDDLE and Smart Co., Amesbury, Mass.

BLUE Ribbon Horse & Carriage Co., 130-170 Cannon St., Bridgeport, Conn.

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 189).

BORCHERS Tonneau Mfg. Co., Dayton, O.

BRIDGEPORT Vehicle Co., Bridgeport, Conn.

BRIGGS Carriage Co., Amesbury, Mass.

BUCKEYE Carriage Body Co., Bellefontaine, Ohio.

BUOB & Scheu, 408 E. Court St., Cincinnati, Ohio.

CARLISLE Body & Gear Wks., Carlisle, Pa.

CARRIAGE Woodstock Co., Owensboro, Ky.

CENTRAL Mfg. Co., Connersville, Ind.

CHICAGO Coach & Carriage Co., 1223 Michigan Ave., Chicago, Ill.

CONNOLLY Carriage Works, Thomas, 7th and Iowa Sts., Dubuque, Ia.

CRAWFORD, G. W. & H. D., Delhi, N. Y.

CURRIER-Cameron Co. (The), 85 Elm St., Amesbury, Mass.

DANN Bros. & Co. (The), 80-88 Franklin St., New Haven, Conn.

DEMOREST, A. L., New Haven, Conn.

DENNETT, G. P., Amesbury, Mass.

DETROIT Carriage Co., Detroit, Mich.

DETROIT Motor Car Supply Co., 1250 Jefferson Ave., Detroit, Mich.

DUNHAM & Son, D. B., Rahway, N. J.

ECLIPSE Buggy Co., Fort Wayne, Ind. (see page 159).

EMOND, J. P. & W. H., 474 Parker St., Boston, Mass.

EMPIRE Gear & Top Co., 53 Mechanic St., Newark, N. J.

FICKLING & Co., Inc., 154 E. 57th St., New York City.

FITZ-GIBBON & Crisp Carriage & Auto Body Co., Trenton, N. J.

FRANTZ Body Mfg. Co. (The), Akron, O.

GOOLD, James Co., Albany, N. Y.

GRAVES & Congdon Co., Amesbury, Mass.

HAVENS Co. (The), Kokomo, Ind.

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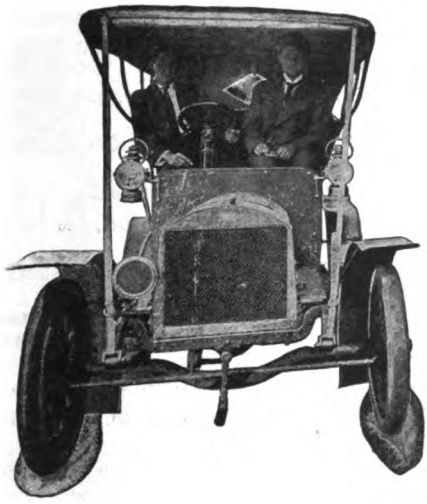

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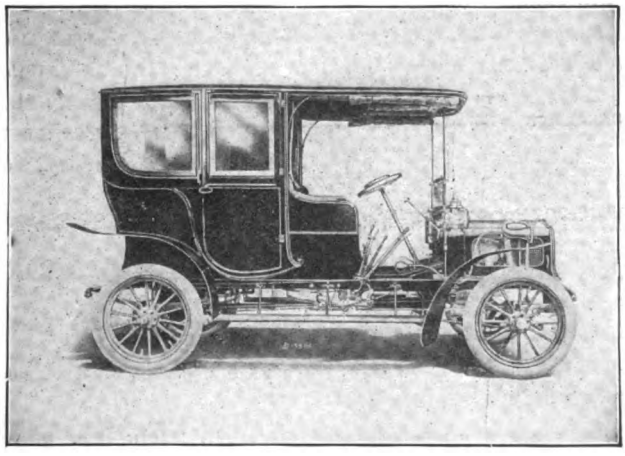

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NEW HAVEN, CONN.

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HILL Mfg. Co., 25 Fuller St., Buffalo, N. Y.

HOLCOMB, H. C., 105 Goffe St., New Haven, Conn.

HORTON, H. A., 127-131 Park St., New Haven, Conn.

HOWARTH & Rogers, Amesbury, Mass.

KARBACH Automobile & Vehicle Co., Omaha, Neb.

KEYSTONE Wagon Wks. Co., Reading, Pa.

KILLAM, Henry, Chestnut and Wooster Sts., New Haven, Conn.

KIMBALL & Co., C. P., 315 Michigan Ave., Chicago, Ill. (see page 37).

KIMBARK, S. D., 80-84 Michigan Ave., Chicago, Ill.

KOEN, James R., 1257 Niagara St., Buffalo, N. Y.

KUNDTZ, Theo., Cleveland, O.

LANE, T. W., Amesbury, Mass.

LAPORTE Carriage Co., Laporte, Ind.

LAWRENCE & Co., L., Newark, N. J.

LEITCH Mfg. Co., Amesbury, Mass.

LOCKE & Co., 218 W. 84th St., N. Y. City.

MICHIGAN Automobile Body Co. (The), 1425-41 Gratiot Ave., Detroit, Mich.

MIDDLETOWN Auto Body Co., Middletown, Conn.

MILLER, A. J., Bellefontaine, O.

MILLER Bros., Amesbury, Mass.

MINOGUE Body & Seat Co., Kansas City, Mo.

MOORE & Munger Co., 602 W. 52d St., New York.

NEW HAVEN Carriage Co., New Haven, Conn. (see page 37).

NEWTON, W. H., & Son, 127 Elm St., Cortlandt, N. Y.

NICHOLS & Co., D. P., 116-122 W. Brookline St., Boston, Mass.

OHIO Carriage Body Co., Bellefontaine, O.

OHIO Scroll & Lumber Co., Covington, Ky.

PEEZ & Hoffman, 3d St., near Fowler, Milwaukee, Wis.

PENN. Auto Metal Body Mfg. Co., Sinking Springs, Pa.

PETZELT & Keyser, 24th and Locust Sts., Philadelphia, Pa.

PITTSBURGH Reduction Co., Pittsburgh, Pa.

PONTIAC Body Co., Pontiac, Mich.

QUINBY, J. M. & Co., Newark, N. J.

QUINSLER & Co., 26-30 Cambria St., Boston, Mass.

RACINE Novelty Mfg. Co., 600 6th St., Racine, Wis.

RANDS Mfg. Co., Detroit, Mich.

READING Metal Body Co., Reading, Pa.

RECH, Jacob & Sons, 8th St. and Girard Ave., Philadelphia, Pa.

RIVERSIDE Body Factory, Court and Wilkeson Sts., Buffalo, N. Y.

ROBBINS & Co., Irwin, 32 E. Georgia St., Indianapolis, Ind.

SCHUBERT Bros. Gear Co., Oneida, N. Y.

SEABROOK & Smith Carriage Co., 126 Park St., New Haven, Conn.

SHIELDS Carriage Co. (The), Amesbury, Mass.

SPRINGFIELD Metal Body Co., 387 Birnie Ave., Brightwood, Mass. (see page opposite).

STEWART, W. F., Co. (The), Flint, Mich.

STONE & Sons, C., 167-177 Ogden Ave., Chicago, Ill.

STRATTON Carriage Body Co., Muncie, Ind.

STUDEBAKER Bros. Mfg. Co., 378 Wabash Ave., Chicago, Ill.

TERRE Haute Carriage & Body Co., 101 Wabash Ave., Terre Haute, Ind.

UNION Buggy Co., Pontiac, Mich.

UNION City Body Co., Union City, Ind.

WALKER Carriage Co., Merrimac, Mass.

WILCOX, M. E., Providence, R. I.

WILLOUGHBY Co., 86 Genesee St., Utica, N. Y.

WILSON, C. R., Body Co., Detroit, Mich.

WOGAMAN, J. Webster, Union City, Ind.

WOOD, A. M., 51 Beverly St., Boston, Mass.

WRIGHT Carriage Body Co., Moline, Ill.

YORK Wagon & Gear Co., York, Pa.

BODY IRONS

AUTO Top Co., Fort Wayne, Ind. (see page 153).

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

BOILERS

AMERICAN Boiler Co., 85 N. Kedzie Ave., Chicago, Ill.

BIGELOW Co. (The), New Haven, Conn.

FORG, Peter, Park St., Somerville, Mass.

FRANTZ Auto Co., Cherryville, Pa.

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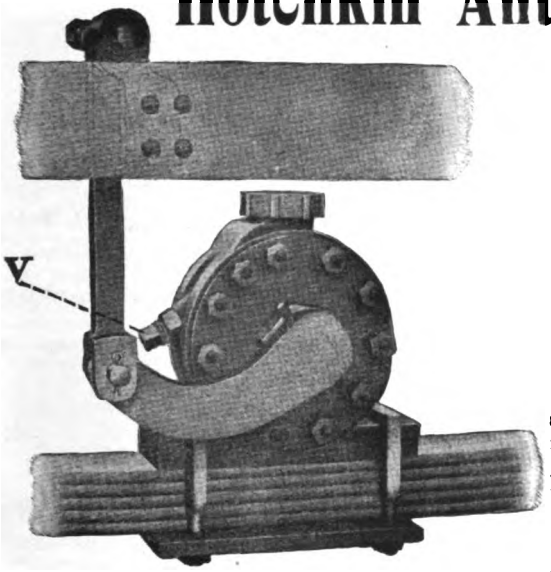
The Hotchkin Anti-Jolt Device



This illustration shows view looking along axle toward wheel from inside of machine

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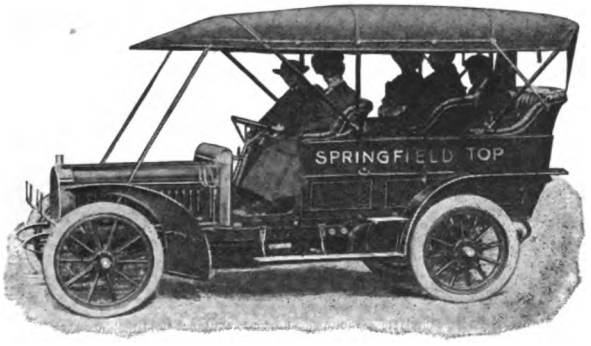

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KNAPP Mfg. Co., 2529 Polk St., N. E., Minneapolis, Minn.

LOCKE Regulator Co., Salem, Mass.

MILNE, Frank, Everett, Mass.

OFELDT & Sons, August, 123 Liberty St., N. Y. City.

OFELDT & Sons, F. W., Nyack-on-the-Hudson, N. Y.

PORTLAND Garage Co., Portland, Me.

ROCHESTER Machine Tool Wks., Rochester, N. Y.

SCHAFFER Machine Mfg. Co. (The), 211 N. Calvert St., Baltimore, Md.

STEAM Carriage Boiler Co., 119 W. First St., Oswego, N. Y.

THROOP Perforating Co., 80 Terrace, Buffalo, N. Y.

TONKIN Boiler Co., Oswego, N. Y.

TREMAIN, C. J., Bradford, Pa.

UNITED Motor & Vehicle Co., 150 Nassau St., N. Y. City.

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

BOILER SHELLS

(See Shells: Boiler, Steel)

(and Shells: Boiler, Copper)

BOILER TUBE EXPANDERS

(See Tube Expanders)

BOLTS AND NUTS

AMERICAN Iron & Steel Mfg. Co., Lebanon, Pa.

ATLAS Bolt & Screw Co. (The), Cleveland, Ohio.

BLAKE & Johnson, Waterbury, Conn.

CHICAGO Screw Co., 2 N. Canal St., Chicago, Ill.

CLARK Bros. & Co., Milldale, Conn.

COLUMBIA Nut & Bolt Co., Inc., Bridgeport, Conn.

COLUMBUS Bolt Wks., 162 W. Randolph St., Columbus, O.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 155).

DETROIT Screw Works, Detroit, Mich.

FRANKLIN Moore Co., Winsted, Conn.

HARTFORD Machine Screw Co., 476 Capitol Ave., Hartford, Conn.

KIRK-Latty Co., Cleveland, O.

LAMSON & Sessions Co., 412-453 Scranton Ave., Cleveland, O.

NATIONAL Screw & Tack Co., Cleveland, O.

PENINSULAR Milled Screw Co., 751 Bellevue Ave., Detroit, Mich.

PROGRESSIVE Mfg. Co., Torrington, Conn.

REPUBLIC Iron and Steel Co., Stock Exch. Bldg., Chicago, Ill.

RUSSELL, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

UPSON Nut Co., Unionville, Conn.

WORCESTER Machine Screw Co., Worces-Elyria, O.

WESTERN Automatic Machine Screw Co., ter, Mass.

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BOOTS (See Cases, Engine, Gear and Chain)

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ASHTABULA Carriage Bow Co., Ashtabula, Ohio.

BEECHER, Walter N., 325 E. 35th St., Chicago, Ill.

BROWN & Co., S. N., Dayton, Ohio.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 155).

CORTLAND Carriage Goods Co., Cortland, N. Y.

CORTLAND Forging Co., Cortland, N. Y.

CRANDALL, Stone & Co., Binghamton, N. Y.

BOXES (Spark Coil)

CHURCHILL Cabinet Co., 72 Churchill St., Chicago, Ill.

KUNDTZ, Theo., Cleveland, O.

MURRAY, W. F., 28 Beach St., Boston, Mass.

WEST Box Co., F. M., 225 Liberty St., Springfield, Mass.

BOXES (Tool)

AMERICAN Steel Barrel Co., 204-206 Varet St., Brooklyn, N. Y.

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

A-Z Co., 527 West 56th St., N. Y. City.

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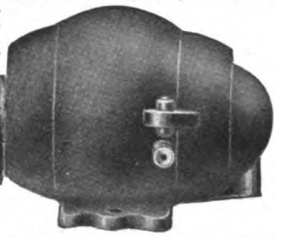
APPLE 1907 IGNITION SYSTEM

THE APPLE 12-S SWITCH BOARD is the connecting link in the dynamo-storage battery ignition system. It contains a volt-ammeter, an indicating snap switch and an automatic cut-out. It shows the battery voltage, battery's discharging rate, dynamo's charging rate, and current consumption of every coil. With a knowledge of the current consumption of each coil, the coil vibrators can be accurately adjusted.

The automatic cut-out is located back of the switch and meter, and is for the purpose of severing the dynamo's connection when the engine is stopped, preventing short circuiting of the battery through the dynamo. No switch needed on the coil when this switch is employed.

The Apple 12-s Switch Board completes the Apple Dynamo-Storage Battery Ignition System. Write TO-DAY for complete description.



THE APPLE 1907 BATTERY CHARGER and the Apple 12-s Switch Board are for use with a storage battery to form a complete ignition system.

The dynamo's charging rate, which is from one-half of an ampere to three amperes, can be varied by means of the new Apple Adjustable Automatic Friction Governor so that the dynamo will charge the battery in proportion to the battery's discharge. (Note new governor in cut.)

Charging the battery in this way is known as "Floating the battery on the line." "Floating the battery on the line" increases the battery's efficiency, lengthens its life, saves the charging expense incurred otherwise and gives uniform voltage.

By means of the new Apple encased ball bearing flexible driving shaft, the dynamo can be installed in most any convenient location on the car—under the seat or on the running board.

The Apple 1907 Model Generator combines the best features of the dynamo and the magneto, and gives its rated charging rate at an uncommonly slow running speed. You ought to know all about this Model.

Bulletin No. 1-A describes this apparatus in detail and it gives complete information regarding the "Floating the battery on the line" system. Write for it to-day.

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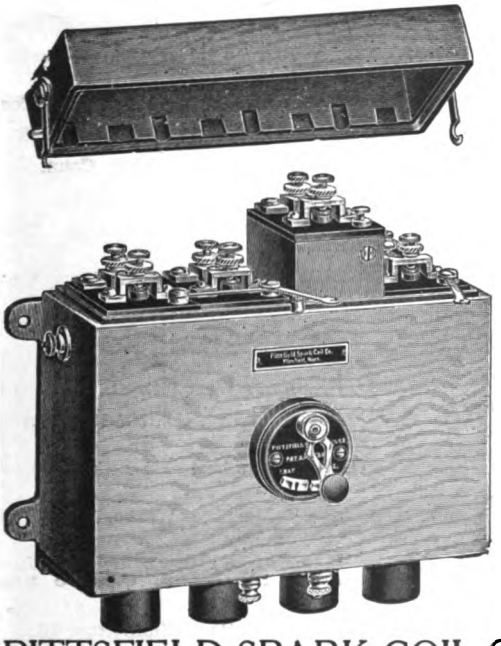
87 St. Clair St. - DAYTON, OHIO

See our exhibit at the New York Automobile Show, Madison Square Garden, January 12th to 19th, the Chicago Automobile Show, February 2d to 9th, the Chicago Boat Show, March 2d to 9th, and the New York National Sportsman's Show.



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All these cars were equipped with the Pittsfield Coil and in several cases with our entire ignition outfit. Can there be better proof of the excellence of our product? Slightly higher in price but far superior in quality and efficiency.

Manufacturers of all kinds of Coils for automobiles, launches and motor cycles. Also High Tension Magnetos, Timers, Jewel Mica Spark Plugs, Terminals, etc. Send for catalog.

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PITTSFIELD SPARK COIL CO., (P. O. Box 796) Pittsfield, Mass.

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BRISCOE Mfg. Co., Detroit, Mich. (see page 123).

HAYES Mfg. Co. (The), 360-370 Maybury Ave., Detroit, Mich. (see page 119).

MOTOR Car Supply Co. (The), Michigan Ave., Chicago, Ill. (see page 21).

BRAKES

GARAGE Equipment Co., Milwaukee, Wis.

GARFORD Co. (The), Elyria, O.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

GOULD, James, Co., Albany, N. Y.

KALISCH Air Brake Co., 1317 Chestnut St., St. Louis, Mo.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

MALTBY Automobile & Mfg. Co., Brooklyn, N. Y.

N. J. Automobile Co., 226-230 Halsey St., Newark, N. J.

PORTLAND Garage Co., Portland, Me.

READING Automobile Co., 26 S. 5th St., Reading, Pa.

ROYAL Equipment Co., 165 Housatonic St., Bridgeport, Conn.

SMITH Co., A. O., Milwaukee, Wis.

TIVY Cycle Co., Williamsport, Pa.

WATRES Mfg. Co., 1135 Broadway, N. Y. City.

WHIPPLE, R. W., Binghamton, N. Y.

YOUSE, E. S., Reading, Pa.

BRAKE BANDS

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page 51).

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

CALDWELL Co. (The), 136 S. 14th St., Philadelphia, Pa.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

NIAGARA Falls Brass Works, Inc., Niagara and Virginia Sts., Buffalo, N. Y. (see page 55).

ROSSENDALE-Reddeway Belting & Hose Co., Newark, N. J.

BRAKE DRUMS

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

CROSBY Co. (The), Buffalo, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

WORCESTER Pressed Steel Co., Worcester, Mass.

BRAKE LOCKS

GARAGE Equipment Co., Milwaukee, Wis.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

TURNER Brass Co., 72 Michigan St., Chicago, Ill. (see page 101).

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ANSONIA Brass & Copper Co., New York, N. Y.

BRIDGEPORT Brass Co., New York, N. Y.

COE Brass Mfg. Co., Torrington, Conn.

DETROIT Copper & Brass Rolling Mills, Detroit, Mich.

HENDRICKS Bros., New York, N. Y.

HOLMES, Booth & Haydens Co., Waterbury, Conn.

HUSSEY & Co., C. G., Pittsburg, Pa.

MANHATTAN Brass Co., New York, N. Y.

NEW HAVEN Copper Co., Seymour, Conn.

PLUME & Atwood Mfg. Co., Waterbury, Conn.

RANDOLPH-Clowes Co., Waterbury, Conn.

ROME Brass & Copper Co., Rome, N. Y.

SCOVILL Mfg. Co., Waterbury, Conn.

SEYMOUR Mfg. Co., Seymour, Conn.

TAUNTON-New Bedford Copper Co., Taunton, Mass.

WATERBURY Brass Co., Waterbury, Conn.

BRAZIERS

A-Z Co. (The), 527 West 56th St., N. Y. City.

BUFFALO Dental Mfg. Co., 587-589 Main St., Buffalo, N. Y.

CLAYTON & Lambert Mfg. Co., Detroit, Mich.

ENTERPRISE Machine Works, 308 N. 5th St., Richmond, Va.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

INVINCIBLE Mfg. Co., Wilmington, Ill.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. ((see page 77).

NATIONAL Cement & Rubber Mfg. Co., 3053 Monroe St., Toledo, O.

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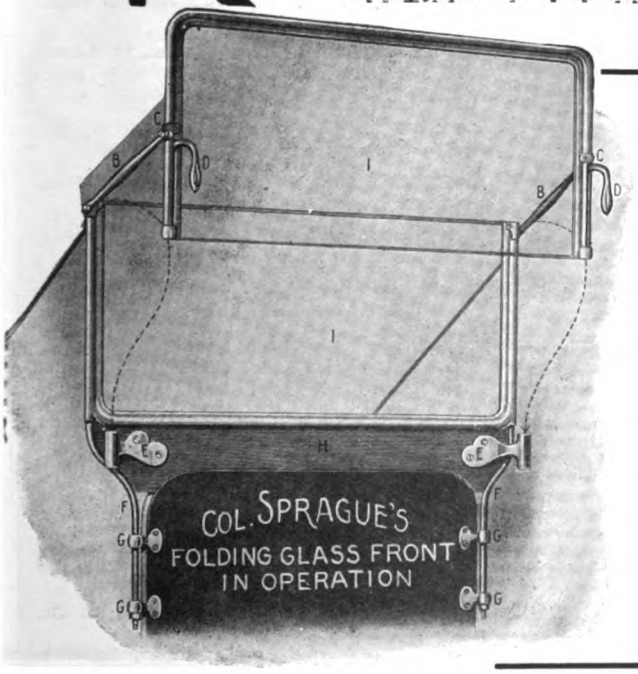

Col. Sprague's New Folding Glass Front

¶ Col. Sprague presents his New Patent Folding Front for 1907. The sash are made either of solid, pressed brass or pressed steel, enameled to imitate oak, mahogany or rosewood. They work completely, and one does not have to leave the seat to change it from one position to another. Open or closed, it is all right. Ask for our catalogue and price list.

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REECE, J. A., 716 A St., N. W., Washington, D. C.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WHITE Mfg. Co., 72 So. Canal St., Chicago, Ill.

BRAZING COMPOUND

A. & J. Mfg. Co., 26 W. Randolph St., Chicago, Ill.

CORTLAND Specialty Co., 176 Railroad St., Cortland, N. Y.

DINGEE, M. H., Lynchburg, Va.

DIXON, Jos., Crucible Co., Jersey City, N. J.

FRANKLIN Moore Co., Winsted, Conn.

KREMBS & Co., 55 Waldo Pl., Chicago, Ill.

NATIONAL Cement & Rubber Mfg. Co., 3053 Monroe St., Toledo, O.

STANDARD Brazing Co., 88 Broad St., Boston, Mass.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WATERBURY Brass Co., Waterbury, Conn.

BRUSHES (Carbon)

NATIONAL Carbon Co., Cleveland, O. (see page 67).

BUCKETS (Collapsible)

ABERCROMBIE & Fitch, 316 B'way, N. Y. City.

BOYLE & Co., John, 112-114 Duane St., New York City.

DUPLEX Folding Pail Co., 420 West 14th St., New York City.

GOODRICH, B. F., Co., Akron, O.

GUTTA Percha and Rubber Mfg. Co., New York, N. Y.

HODGMAN Rubber Co., New York, N. Y.

KNOWLES, C. S., 7 Arch St., Boston, Mass.

RUE Mfg. Co., 215 Race St., Philadelphia, Pa.

WATERBURY Brass Co., Waterbury, Conn.

BUFFING MACHINES

COATES Clipper Mfg. Co., Worcester, Mass. (see page opposite).

BUMPERS

CALUMET Tire & Rubber Co., 43d and Wabensia Aves., Chicago, Ill.

HARTFORD Rubber Wks. Co., Hartford, Conn. (see page 161 and 162).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

BURNERS (Gasoline and Kerosene)

AMERICAN Burner Co., 81 No. Kedzie Ave., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

CHICAGO Auto Mfg. Co., 4120 State St., Chicago, Ill.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FORG, Peter, Park St., Somerville, Mass.

FRANZ Mfg. Co., Cherryville, Pa.

LIQUID Fuel Engineering Co., Bridgeport, Conn.

LYNN Auto. Co., 274 Broad St., Lynn, Mass.

LOCKE Regulator Co., Salem, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NATIONAL Equipment Co., Holland Bldg., St. Louis, Mo.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

OFELDT & Sons, August, 123 Liberty St., New York.

OFELDT & Sons, F. W., Nyack-on-the-Hudson, N. Y.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

STEAM Carriage Boiler Co., 119 West First St., Oswego, N. Y.

TAUNTON Motor Carriage Co., Taunton, Mass.

TONKIN Boiler Co., Oswego, N. Y.

TRIUMPH Mfg. Co., Nashville, Tenn.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WALKER Co., E. C., 1913-1923 Logan St., Louisville, Ky.

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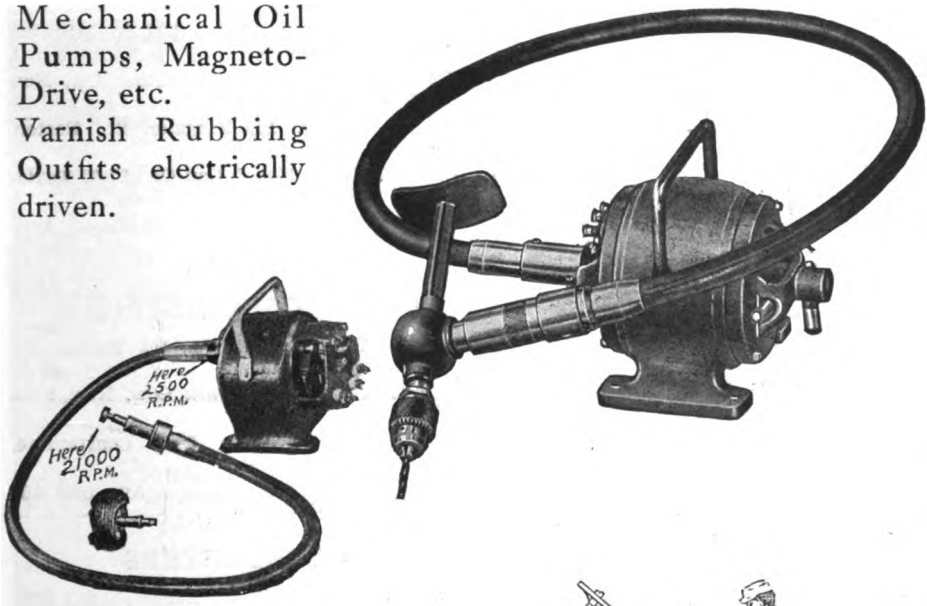

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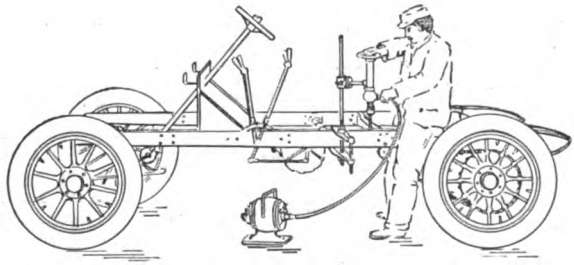

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AMERICAN Lava Co., Chattanooga, Tenn.

CARROLL, J. B., 136 Lake St., Chicago, Ill.

CRANE Co., W. N., 1131-1133 Broadway, N. Y. City.

KIRCHBERGER & Co., 50 Warren St., New York City.

STAR Acetylene Gas Burner Co., Chattanooga, Tenn.

STATE Line Talc. Co., Chattanooga, Tenn.

STEWART, D. M., Mfg. Co., of Canada, 151 King St., W., Toronto.

CANOPIES (See Tops)

CANS (See Oil Cans)

CANS (Waste)

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 123).

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

CAPS (Auto)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

DEMMERLE & Co., 248 W. 23d St., New York City.

DETROIT Cap Mfg. Co., 11-17 Woodbridge St., W., Detroit, Mich.

DINNER, Isaac H., Co., 78 Bedford St., Boston, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

KIBBE, C. S., Batavia, N. Y.

LASKY & Levy, 20 and 22 Waverly Place, New York City.

LILLEY Co., M. C., Columbus, O.

MAXFIELD & Co., Glen C., 170 E. Madison St., Chicago, Ill.

MORAWETZ Co. (The), 343 Broadway, Milwaukee, Wis.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

PONTIAC Knitting Co., Pontiac, Mich.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

REVILLON Bros., 15 W. 28th St., New York City.

RIPON Knitting Wks., Ripon, Wis.

SAKS & Co., Broadway, 33d to 34th St., New York City.

SCANDINAVIAN Fur & Leather Co., New York, N. Y.

SHAW, Ora D., 109 Kingston St., Boston, Mass.

SPRINGFIELD Hat & Cap Co., 27-35 Taylor St., Springfield, Mass.

WANCKEL, Manfred, 640 Madison Ave., New York City.

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ACETYLENE Gas Ill. Co., 105 Walker St., New York.

ACETYVONE Co., 38 Park Row, New York City.

AMERICAN Carbolite Co., Constantine, Mich.

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ACORN Brass Mfg. Co., Chicago, Ill.

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AURORA Automatic Machinery Co., 421 Claim St., Aurora, Ill.

AUTO Improvement Co., 316 Hudson St., New York City.

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AXIOM Carbureter Mfg. Co. (The), 106 E. 28th St., N. Y. City.

BAIRD-Banks Mfg. & Supply Co., 35 Warren St., N. Y. City.

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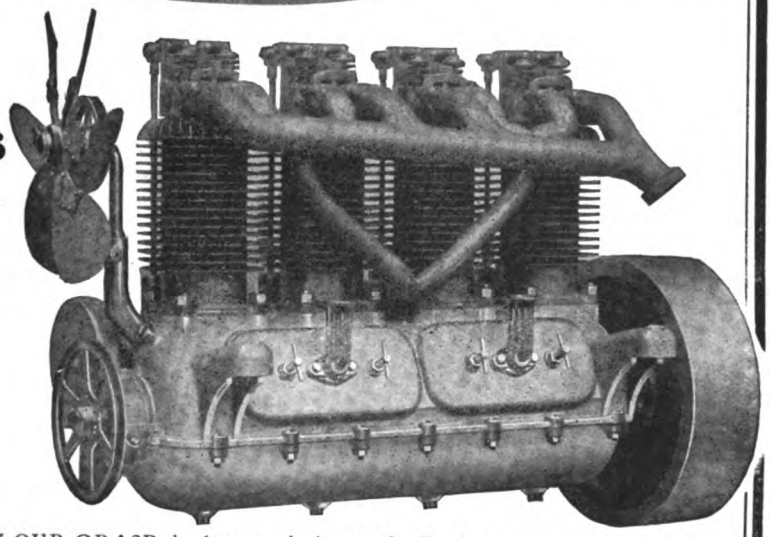

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CLEMICK-Hirsch Co., Milwaukee, Wis.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich.

CULVER Novelty Co., Culver, Ind.

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DE MAY & Parsons, 628 Fernwood Ave., Toledo, O.

DUPLEX Roller Bushing Co., Belfast, Me.

ESSEX Brass Co., G. B., Detroit, Mich.

FAST, Otto, Greenfield and 25th Aves., Milwaukee, Wis.

GAITHER-Owen Co., 40 W. 60th St., N. Y. City.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

GODDU Bros., Winchester, Mass.

HAGAR Carburettor Co., 819 Broadway, Nashville, Tenn.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

HEATH Dry Gas Co., 1623 Broadway, N. Y. City.

HOLLEY Bros., 661-673 Beaubien St., Detroit, Mich.

ILLINOIS Auto & Parts Co., Globe and Main Sts., Peoria, Ill.

IMPERIAL Brass Mfg. Co., 251 So. Jefferson St., Chicago, Ill.

JOHNSTON Mach. Co., 86 High St., Woodbury, N. J.

KAUFMAN, Chas., Oshkosh, Wis.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

LAKEVIEW Auto. Co., 1045 Sheffield Ave., Chicago, Ill.

LAVIGNE Mfg. Co., 132 E. Larned St., Detroit, Mich.

LEE Mfg. Co. (The), South Park, Port Huron, Mich.

LIPMAN Mfg. Co., Beloit, Wis.

LOCKE Regulator Co., Salem, Mass.

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MASSNICK Mfg. Co., 1567 River St., Detroit, Mich.

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MAYO Damper Co., 355 Walnut St., Pottstown, Pa.

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McHARDY Carbureter Co., Providence, R. I.

MORGAN, B., 88 John St., Newport, R. I.

MOTOR Components Mfg. Co., 119-121 E. Walnut St., Des Moines, Ia.

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NORTH Chicago Mach. Co., North Chicago, Ill.

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PUTNAM, R. H., 57 Lebanon St., Springfield, Mass.

RICHARD, Francois, 511 W. 59th St., N. Y. City.

RUBAY, Leon, 136 W. 38th St., N. Y. City (Importer).

SARIS, J. H., Beloit, Wis.

SHERWOOD Mfg. Co., Buffalo, N. Y.

SINTZ, Guy L., Fulton and Front Sts., Grand Rapids, Mich.

SPEED Changing Pulley Co., 750 E. Washington St., Indianapolis, Ind. (see page 47).

SWAIN Engine Co., 140 West Lake St., Chicago, Ill.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

VAN DUZEN Gaso. & Gas Engine Co., State and Mill Sts., Cincinnati, O.

WESTERN Motor Co., Logansport, Ind.

WHEELER & Schebler, Indianapolis, Ind.

WINKLEY Co. (The), 226 Abbott St., Detroit, Mich.

XARDELL & Co., C. A., Utica, N. Y.

CARRIAGE HARDWARE

BLAKESLEE Forging Co., Plantsville, Conn.

CLEVELAND Hardware Co. (The), 1300 Lake St., Cleveland, O.

COLUMBUS Bolt Works, 162 W. Randolph St., Columbus, O.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 155).

CORTLAND Carriage Goods Co., Cortland, N. Y.

COWLES, C. & Co., New Haven, Conn.

DOUGLAS & Lomason Co., 306 Grand River Ave., Detroit, Mich.

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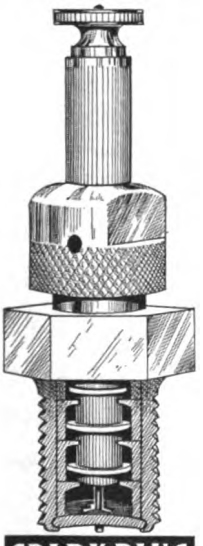

SPARK PLUG

Freedom

Definition Century Dictionary—Exemption from arbitrary, despotic, or autocratic control.

¶ We might have called this spark plug the FREEDOM, for it exempts the user from the "arbitrary, despotic and autocratic control" of the average spark plug.

¶ But the fact we call it THE SHUR-FIRE doesn't interfere a bit with its ability to insure absolute FREEDOM from all spark plug annoyances.

¶ We don't believe in the SHUR-FIRE SPARK PLUG because we make it. We make it because we believe in it. And this belief is so profound with us, we sell it with this guarantee: MONEY BACK IF YOU WANT IT.

¶ Send us $1.50 cash, check or even stamps will do, and we will send prepaid by return mail the SHUR-FIRE SPARK PLUG, which means FREEDOM to you.

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FRANKLIN Moore Co. (The), Winsted, Conn.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

HARPER Co., Walter J., 229-231 Mulberry St., Newark, N. J.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

METAL Stamping Co., 243 West St., N. Y. City.

MORSS Co., A. S., 210 Commercial St., Boston, Mass.

MURDOCK, Jr., Co., James, 116 Opera Pl., Cincinnati, O.

NEIDER Co., F. A. (The), Augusta, Ky. (see page 155).

NEW Britain Hardware Mfg. Co., New Britain, Conn.

NON-CORROSIVE Metal Co., Inc., Watertown, Mass.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

ROEHM & Davison, Woodbridge & Wayne Sts., Detroit, Mich.

SCHERER, H., & Co., 280 Jefferson Ave., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

TAYLOR Co., H. D., 101-105 Oak St., Buffalo, N. Y.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WING Co., Chas., Amesbury, Mass.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

CASES (Engine, Gear and Chain)

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (see page 155).

AUTO Top Co., Fort Wayne, Ind. (see page 153).

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

DETROIT Auto. Top Co., Detroit, Mich.

REEDY, W. E., Lima, O.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WILEY & Son Co., Wm. H., Box 30, Hartford, Conn. (see page 149).

CASTINGS (Brass, Bronze, Aluminum and Copper)

ALLEN Mfg. Co., W. D., 151 Lake St., Chicago, Ill.

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page opposite).

ALUMINUM Foundry Co., Manitowoc, Wis.

AMERICAN Brass Fdry. Co., Hyde Park, Mass.

AMERICAN Fdry. & Mach. Co., Hanover, Pa.

AMERICAN Pin Co., Waterbury, Conn.

BRIDGEPORT Deoxidized Bronze & Metal Co., Bridgeport, Conn.

BUCKEYE Iron & Brass Wks., 324 E. 3d St., Dayton, O.

CALDWELL Co. (The), 136 S. 4th St., Philadelphia, Pa.

CHAPMAN & Co., J. B., 51 Taylor St., Springfield, Mass.

CHICAGO Hardware Fdry. Co., North Chicago, Ill.

CLARK, John W., Albany, N. Y.

CLUM & Atkinson, 575 Lyell Ave., Rochester, N. Y.

COLUMBUS Brass Co., Columbus, O.

CRAMP & Sons Ship & Engine Building Co., Wm., Philadelphia, Pa.

ELKHART Brass Mfg. Co., Prospect St., Elkhart, Ind.

ELM CITY Brass Co., New Haven, Conn.

ENTERPRISE Foundry Co., Detroit, Mich.

EUREKA Tempered Copper Wks., Northeast, Pa.

FOREST City Brass Wks., Cleveland, O.

GAYLORD Co., F. L., Ansonia, Conn.

GERSON-Carey Co., Lansing, Mich.

GLOBE Malleable Iron Co., Syracuse, N. Y.

GRAHAM, James & Co., 293 Wooster St., New Haven, Conn.

HENDRYX & Co., Andrew B., New Haven, Conn.

HOFELLER Brass Fdry. Co., 100 Terrace, Buffalo, N. Y.

HOMER Brass Works, Inc., 231 Race St., Philadelphia, Pa.

HUMPHREYS Mfg. Co., Mansfield, O.

IMPERIAL Brass Mfg. Co. (The), 251 So. Jefferson St., Chicago, Ill.

JEFFERSON Brass Foundry, Brooklyn, N. Y.

KEYSTONE Brass Fdry. Co., 188 Berks St., Philadelphia, Pa.

KOKOMO Brass Wks., 351 N. Smith St., Kokomo, Ind.

LANGSENKAMP Bros., Indianapolis, Ind.

LIBERTY Bell Co., Bristol, Conn.

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There Is a Reason Why

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ALLYNE

ALUMINUM and BRONZE CASTINGS *solely* in the making of their cars.

Business economy and a desire to *sustain* a reputation for making a high-grade, serviceable car, demand that these manufacturers *know* beyond the shadow of a doubt the QUALITY of the aluminum and bronze castings they are using.

ALLYNE CASTINGS become indispensable wherever introduced—hence their *continued* use by these discriminating builders.

Are You One of These?

THE ALLYNE BRASS FOUNDRY CO.

CLEVELAND - BUFFALO - DETROIT

Largest producer of Aluminum Castings in the United States

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LIGHT Mfg. & Fdry. Co., Pottstown, Pa.

LOUGH-Scott Co. (The), 26 Cortlandt St., N. Y. City.

MANHATTAN Brass Co., New York, N. Y.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 31).

MENCHEN Electrical Co., Joseph, 354 W. 50th St., N. Y. City (see page 87).

MICHIGAN Brass Mfg. Co. (The), 74-78 Fort St. E., Detroit, Mich.

NEW JERSEY Aluminum Co., 19th and Springfield Ave., Newark, N. J.

NIAGARA Falls Brass Wks., Inc., Niagara and Virginia Sts., Buffalo, N. Y. see page 55).

NOLTE Brass Co., Springfield, O.

NON-CORROSIVE Metal Co. (Inc.), Watertown, Conn.

NOONAN Tool & Machine Wks., Rome, N. Y.

NORWALK Brass Co., Norwalk, Conn.

OBERDORFER Brass Co., M. L., 804 East Water St., Syracuse, N. Y.

OHIO Brass Co., Mansfield, O.

PHOSPHOR Bronze Smelting Co., Philadelphia, Pa.

PIONEER Brass Works, Indianapolis, Ind.

PITTSBURG Brass Mfg. Co., 3153 Penn Ave., Pittsburg, Pa.

PITTSBURG Reduction Co., Pittsburg, Pa.

PROVIDENCE Brass Foundry & Machine Co., Providence, R. I.

RACINE Brass & Iron Co., Racine, Wis.

REEVES & Son, Paul S., 1415 Catherine St., Philadelphia, Pa.

RYAN & Co., J. J., 68-74 W. Monroe St., Chicago, Ill.

SHERWOOD Brass Works, 1167 Jefferson Ave., Detroit, Mich.

SPENCER'S Sons, I. S., Guilford, Conn.

STANDARD Foundry Co., Hartford, Conn.

STOVER Mfg. Co., Freeport, Ill.

SYRACUSE Aluminum & Bronze Co., Syracuse, N. Y. (see page opposite).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

UNIQUE Metal Co., 89-91 Niagara St., Buffalo, N. Y.

UNITED States Aluminum Co., Pittsburg, Pa.

U. S. Aluminum Castings Co., Hamilton & Vandalia Aves., Cincinnati, O.

U. S. Bronze Co., 149 Columbus St., Cleveland, O.

VINCENT Valve Co., Sandusky, O.

WALTHAM Brass & Aluminum Co., Waltham, Mass.

WESTERN Brass Mfg. Co., 21st and Rockwell Sts., Chicago, Ill.

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

CASTINGS (Gray Iron)

ACME Fdry. Co., Sweeney St., Cleveland, O.

AMERICAN Fdry. & Mach. Co., Hanover, Pa.

BARCUS & Co., Geo., Wabash, Ind.

BARLOW, Arthur E., 28 Orange St., Newark, N. J.

BELLE CITY Mfg. Co., Racine Junction, Wis.

BRIDGEPORT Malleable Iron Co., Bridgeport, Conn.

BUFFALO Foundry Co., Buffalo, N. Y.

CAPITOL Foundry Co., Hartford, Conn.

CHICAGO Hardware Fdry. Co., North Chicago, Ill.

CRAMP & Sons Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

DETROIT Stoker & Foundry Co., No. Grand Blvd. and Riopelle St., Detroit, Mich.

ENTERPRISE Fdry. Co., Detroit, Mich.

ERIE Foundry Co., Erie, Pa.

FERRO Machine & Fdry. Co. (The), 115 Wade Building, Cleveland, O. (see page 175).

FULTON Fdry. & Mach. Wks., 25 Furman St., Brooklyn, N. Y.

GREY Iron Castings Co., Mt. Joy, Pa.

HAYES Foundry Co., Lynn, Mass.

HOLBROOK-Armstrong Iron Co., Racine, Wis.

HOPSON & Chapin Mfg. Co., New London. Conn.

INDIANAPOLIS Foundry Co., Indianapolis, Ind.

INTER-State Foundry Co., Cleveland, O.

LOUGH-Scott Co. (The), 26 Cortlandt St., N. Y. City.

MANUFACTURERS' Fdry. Co., Waterbury, Conn.

MARINETTE Gas Eng. Co., Chicago Heights, Ill.

MASSEY Machine Co., Watertown, N. Y.

MEEKER Fdry. Co., 95 Clay St., Newark N. J.

PALMERS & De Mooy Fdry. Co., Cleveland, Ohio.

RACINE Brass & Iron Co., Racine, Wis.

SESSIONS Foundry Co., Bristol, Conn.

SPENCER'S Sons, I. S., Guilford, Conn.

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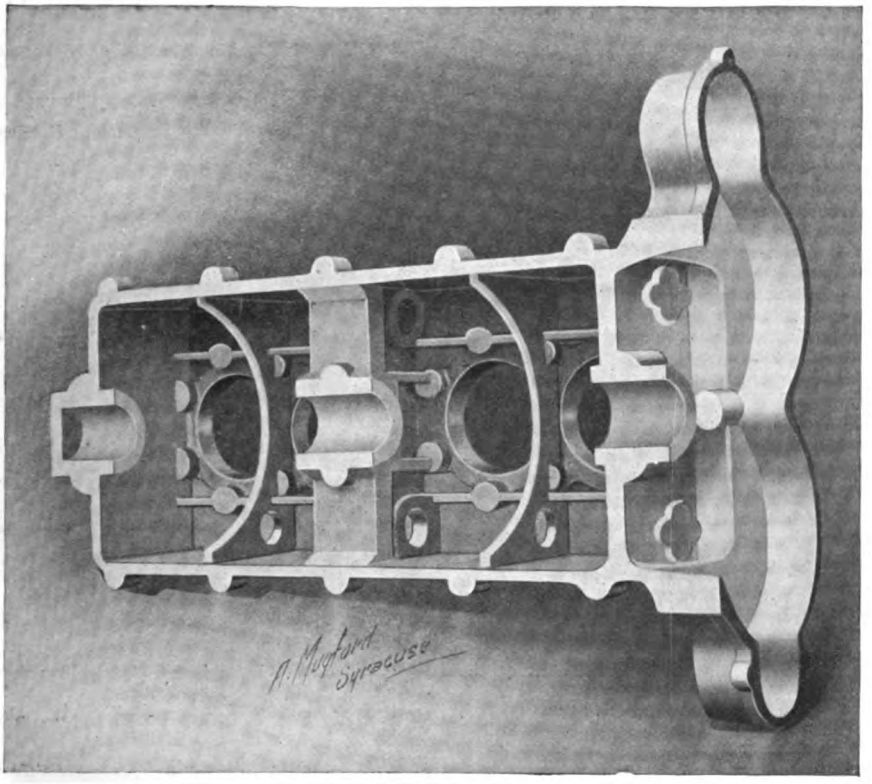

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Our Facilities Are Second to None

We have four times the capacity we had last year and can give you castings in a hurry.

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SYRACUSE, N. Y.

THOMAS J. WETZEL, Eastern Sales Agent, 29 W. 42d St., New York.

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STANDARD Fdry. & Mfg. Co., Cleveland, O.

STOVER Mfg. Co., Freeport, Ill.

STOWELL Mfg. & Fdry. Co., So. Milwaukee, Wis.

TARRANT Foundry Co., Chicago, Ill.

UTICA Foundry Co., Utica, N. Y.

UTICA Steam Eng. & Boiler Wks., Utica, N. Y.

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WESTERN Motor Co., Logansport, Ind.

WILCOX, Crittenden & Co., Middletown, Conn.

CASTINGS (Malleable Iron)

ACME Steel & Malleable Iron Wks., 245 Military Road, Buffalo, N. Y.

ARCADE Malleable Iron Co., Worcester, Mass.

BARLOW, Arthur E., Newark, N. J.

BEAVER Dam Malleable Iron Co., Beaver Dam, Wis.

BRIDGEPORT Malleable Iron Co., Bridgeport, Conn.

BUHL Malleable Iron Co., Detroit, Mich.

COLUMBUS Malleable Iron Co., Columbus, O.

DAYTON Malleable Iron Co., Dayton, O.

EBERHARD Mfg. Co. (The), Cleveland, O.

FLAGG & Co., Stanley G., Philadelphia, Pa.

FRAZER & Jones Co., Syracuse, N. Y.

ILLINOIS Malleable Iron Co., 535 Diversly Blvd., Chicago, Ill.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 75).

LOUGH-Scott Co., 26 Cortlandt St., N. Y. City.

MALLEABLE Iron Fittings Co., Branford, Conn.

MEEKER Fdry. Co., 95 Clay St., Newark, N. J.

MINNESOTA Malleable Iron Co., St. Paul, Minn.

MOLINE Malleable Iron Co., St. Charles, Ill.

NATIONAL Malleable Castings Co., Cleveland, O.

NAUGATUCK Malleable Iron Co., Naugatuck, Conn.

NORWAY Iron & Steel Co., York, Pa.

OSHKOSH Malleable Iron Co., Oshkosh, Wis.

PORT HURON Engine & Thresher Co., Port Huron, Mich.

RACINE Malleable & Wrought Iron Co., Racine, Wis.

RHODE ISLAND Malleable Iron Wks., Hills Grove, R. I.

SOUTH Side Steel & Malleable Casting Co., Windlake and 14th Aves., Milwaukee, Wis.

STOWELL Mfg. & Fdry. Co., So. Milwaukee, Wis.

SYRACUSE Malleable Iron Wks., Syracuse, N. Y.

TRENTON Malleable Iron Co., Trenton, N. J.

WILMINGTON Malleable Iron Co., Wilmington, Del.

CASTINGS (Steel)

ACME Steel & Malleable Iron Wks., 245 Military Road, Buffalo, N. Y.

ADRIAN Steel Casting Co., Adrian, Mich.

AMERICAN Steel Castings Co., Chester, Pa.

ARCADE Malleable Iron Co., Worcester, Mass.

ATHA Steel Co., Newark, N. J.

BETHLEHEM Steel Co., So. Bethlehem, Pa.

BUFFALO Crucible Casting Co., 25 Washington St., Buffalo, N. Y.

CARPENTER Steel Co. (The), Reading, Pa.

CHESTER Steel Castings Co., Chester, Pa.

CHROME Steel Works, Brooklyn, N. Y.

CRUCIBLE Steel Casting Co., Lansdowne, Pa.

CRUCIBLE Steel Castings Co., Milwaukee, Wis.

DUTCHER Co., J. A. & P. E., Milwaukee, Wis.

FERRO Carbon Castings Co., Frankfort, Philadelphia, Pa.

FLAGG & Co., Stanley G., Philadelphia, Pa.

FRAZER & Jones Co., Syracuse, N. Y.

JOHNSON & Co., Isaac G., Spuyten Duyvil, N. Y.

JOHNSTON, Geo. H., P. O. Box 13, Sparrows Point, Md.

LOGAN Mfg. Co., Phoenixville, Pa.

LOUGH-Scott Co. (The), 26 Cortlandt St., N. Y. City.

MACINTOSH, Hemphill & Co., Pittsburg, Pa.

MASSACHUSETTS Steel Casting Co., West Everett, Mass.

MESTA Machine Co., Pittsburg, Pa.

MILWAUKEE Steel Fdry Co., Milwaukee, Wis.

N. E. Steel Castings Co., Hyde Park, Mass.

NEWARK Iron & Steel Co., Newark, O.

NEW JERSEY Steel Co., Rahway, N. J.

NEW Process Steel Co. (The), Marshall, Mich.

NORWAY Iron & Steel Co., York, Pa.

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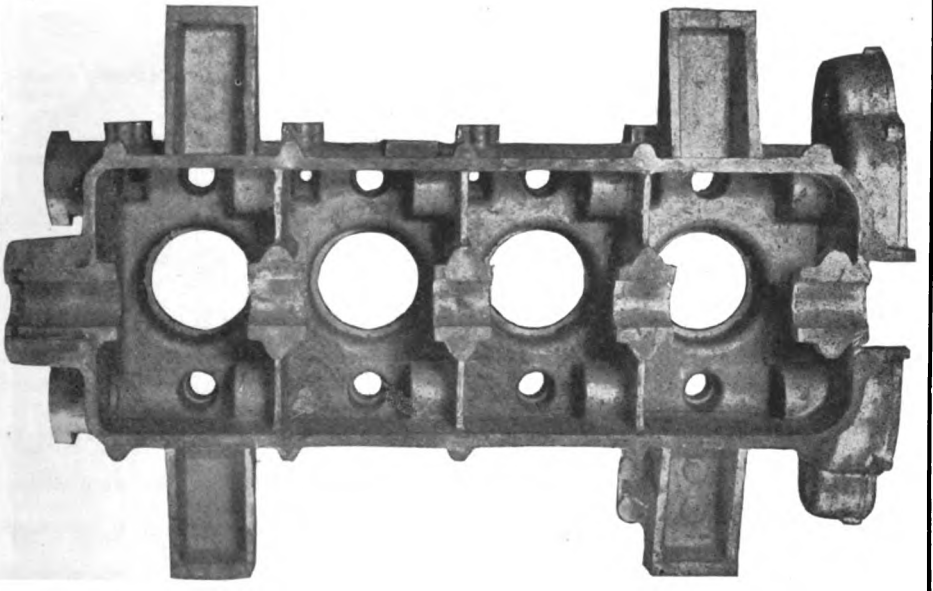

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BRASS, PHOSPHOR BRONZE, MANGANESE BRONZE

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QUALITY OF CASTINGS, WORKMANSHIP AND DELIVERIES GUARANTEED

NIAGARA FALLS BRASS WORKS

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OTIS Steel Co., Cleveland, O.

PROVIDENCE Steel Castings Co., 164 Allens Ave., Providence, R. I.

RIVERSIDE Foundry, The, 451-473 Riverside Ave., Newark, N. J.

SMITH Steel Castings Co., Geo. H., 500 Clinton St., Milwaukee, Wis.

TAYLOR Iron & Steel Co., High Bridge, N. Y.

TOBIN-Gerlinger Steel Castings Co., West Allis, Wis.

TOOL Steel Castings Co., 90 Canal St., Boston, Mass.

UNIFORM Steel Co., Newark, N. J.

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WHITELEY Steel Co., Muncie, Ind.

WILMINGTON Malleable Iron Co., Wilmington, Del.

WORCESTER Steel Foundry Co., Worcester, Mass.

CEMENT (Tire)

AMERICAN Cement & Oil Co., 44 W. Quincy St., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BROOKLYN Rubber Co., 397 Summer Ave., Brooklyn, N. Y.

BUFFALO Specialty Co., Buffalo, N. Y.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

G. A. HOSMER Co., 376 Ellicott St., Buffalo, N. Y.

LYON Rubber Co., Akron, O.

MAGNET Cement & Dressing Co., 878 No. 48th St., Philadelphia, Pa.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NATIONAL Cement & Rubber Mfg. Co., Toledo, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

REA Bros. & Co., 202 Nicollet Ave., Minneapolis, Minn.

TINGLEY & Co., Chas. O., Rahway, N. J.

CHAINS

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (see page 111).

DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapolis, Ind. (see page opposite).

DUCKWORTH Chain & Mfg. Co., Springfield, Mass.

LEFEVRE Arms Co., Syracuse, N. Y.

LINK Belt Co., Chicago, Ill.

LINK Belt Engineering Co., Nicetown, Pa.

MILLER, Chas. E., 97 Reade St., N. Y. City. (Importer.)

MORSE Chain Co., Trumansburg, N. Y.

PEUGEOT Freres, 296 Broadway, N. Y. City (see page 7).

WHITNEY Mfg. Co. (The), Hartford, Conn.

CHANNELS.

AMERICAN Steel & Wire Co., The Rookery, Chicago, Ill.

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

GARFORD Co. (The), Elyria, O.

STANDARD Welding Co., Cleveland, O.

WESTON-Mott Co., Flint, Mich., and Utica, N. Y.

CHARGING EQUIPMENT (Electrical)

ADVANCE Mfg. Co., Hamilton, O.

BAKER Motor Vehicle Co., Cleveland, O.

BENJAMIN Electric Mfg. Co., 42 W. Jackson Blvd., Chicago, Ill. (see page 107).

BRONSON & Davis, 463 Fairmount Ave., Blue Island, Ill.

BULLOCK Electric Mfg. Co., Cincinnati, O.

COOPER-Hewitt Electric Co., 220 W. 29th St., N. Y. City.

ELECTRIC-Vehicle & Garage Co., 621 Grand Ave., Milwaukee, Wis.

ELWELL-Parker Electric Co., 1076 Hamilton St., Cleveland, O.

GENERAL Elec. Co., Schenectady, N. Y.

GENERAL Power Co. (The), 100 William St., N. Y. City.

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HAVE

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REAMED HOLES for Rivets and Bushings prevent elongation.

DIAMOND CHAINS outnumber others, outwear others, are stronger than others.

Valuable to Jobbers and Dealers

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231 W. Georgia St., INDIANAPOLIS, IND.

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MERRIAM-Abbott Co., 60 E. Prospect St., Cleveland, O.

NEW England Motor Co., Liberty Square, Lowell, Mass. (see page 33).

RICHARDSON Engineering Co., Hartford, Conn. (see page 135).

ROTH Bros. & Co., 27-29 S. Clinton St., Chicago, Ill.

WAGNER Electrical Mfg. Co., 2017 Locust St., St. Louis, Mo.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.

CLEVICES (See Screw Machine Products)

CLOCKS (Auto)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

CHELSEA Clock Co., 16 State St., Boston, Mass. (Auto and Motor Boat) (see page opposite).

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

LEVY, Manasseh, 182 Broadway, New York.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

WILSON Auto. Clock Co., 935 Arch St., Philadelphia, Pa.

WHEELOCK Motor Car Clock Co., Tremont Bldg., Boston, Mass.

CLOTHING (Auto)

AMERICAN Buffalo Robe Co., Buffalo, N. Y.

AUTO Garment Co., 208 B Ave., Cedar Rapids, Ia.

BISHOP & Co., The J. H., Wyandotte, Mich.

BRANN, E., 1225 Park Ave., N. Y. City.

BROOKS Bros., 22d St. and B'way, N. Y. City.

CROSBY Frisian Fur Co., 116 Mill St., Rochester, N. Y.

DAVIS Robe Co., The, Inc., 1307 Champlain Bldg., Chicago.

DEMMERLE & Co., 248 W. 23d St., N. Y. City.

DOUGHERTY & Colt Mfg. Co., 105 W. Bridge St., Columbus, O.

ENTERPRISE Rubber Co., 110 Federal St., Boston, Mass.

FULLER & Sullivan, 19 Elliott St., Boston, Mass.

GILBERT Mfg. Co., New Haven, Conn. (see page 149).

GUNTHER'S Sons, G. C., 184 5th Ave., N. Y. City.

HANSEN Mfg. Co., O. C., 356 E. Water St., Milwaukee, Wis. (see page 79).

HODGMAN Rubber Co., 806 Broadway, N. Y. City.

LILLEY, M. C., & Co., Columbus, O.

MACULLAR-Parker Co., Boston, Mass.

MESINGER Mfg. Co., H. & F., 1801-1803 First Ave., N. Y. City.

MILFORD Auto. Coat Co. (The), Milford, Mass.

MOORE-Smith Co., Boston, Mass.

MORAWETZ Co. (The), 343 Broadway, Milwaukee, Wis.

N. Y. Leather Coat Co., 207 Greene St., New York.

OUR Own Mfg. Co., 568-574 Broadway, New York.

PIONEER Woolen Mills, 1120 Beaufait St., Detroit, Mich.

ROGERS, Peet & Co., N. Y. City.

RUSZITS, John, Fur Co., 73-77 Mercer St., N. Y. City.

SAKS & Co., 34th St. and B'way, N. Y. City.

SCANDINAVIAN Fur & Leather Co., 16 W. 33d St., New York, N. Y.

SCOTT Muffler Co. (The), 71 Gallia St., Portsmouth, O.

SHUMAN, A., & Co., Boston, Mass.

SMITH, Gray & Co., N. Y. City.

SMITH, Crary & Davidge, 174 Water St., Binghamton, N. Y.

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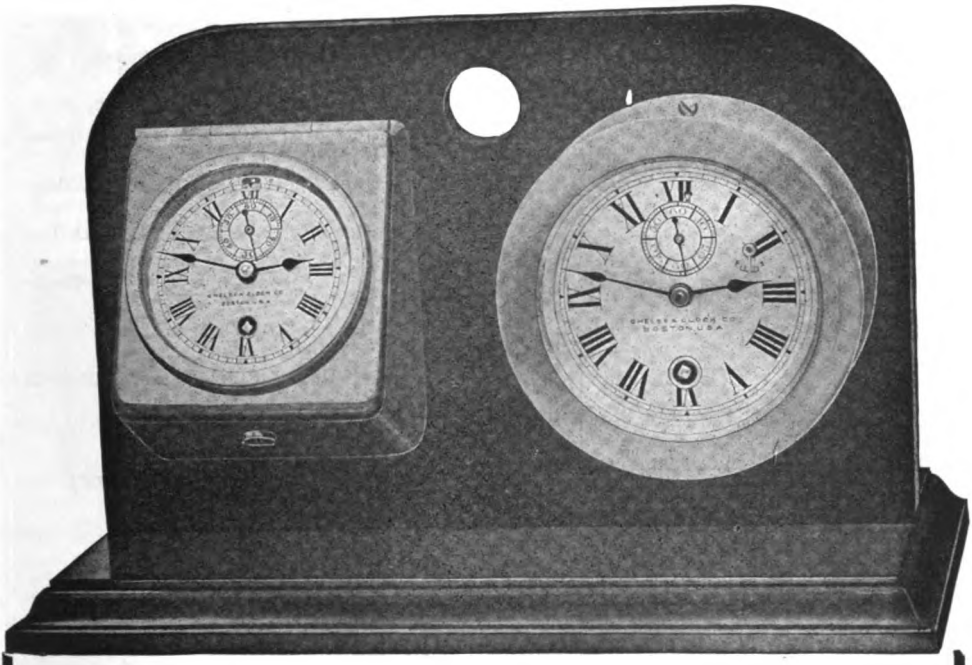

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THE "CHELSEA" AUTO CLOCK

(TRADE MARK)

BEST IN THE WORLD

¶ Clocks built with a view to stand the jars and jolts and rough riding of Automobiles. Reputation the highest. Used by parties demanding the BEST

PRICE LIST

In "Special" Cases (Design of Case Patented Dec. 19, 1905)		In "Round" Cases	
2¾ inch "Special" Auto Clock,	$36	2¾ inch Auto Clock,	$26
3½ inch "Special" Auto Clock,	$45	3½ inch Auto Clock,	$28
3½ inch "Special" Motor Clock,	$41	3½ inch Motor Clock,	$24

Wood Stands, if wanted by Dealers, viz.: for showing two clocks, $2.00; for showing one clock, $1.50

Sizes stated are the approximate diameters of the dials.

Above illustration shows in reduced size the 2¾ inch "SPECIAL" Auto Clock and 3½ inch (Round Cased) MOTOR Clock. The sizes are the approximate diameters of the dials. All are in Duplex (Patent applied for) Polished Cast Brass Cases, the most thoroughly waterproof case on the market. The "SPECIALS" show dial on angle; its clock when removed from outer (locked) case is excellent for use on mantels, bureaus, etc.; very convenient when touring. Outer case secured to dashboard by hidden screws. The 3½ inch MOTOR Clock is a strong, reliable clock, but the AUTO Clocks have a somewhat finer train. You want the BEST? Ask for the "CHELSEA."

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YOU want the BEST? Ask for the "CHELSEA"

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SPEAR-Martin Fur Co., Burlington, Vt.

SPRAGUE, F. H. Co., Orange, Mass.

STALL & Dean Mfg. Co., Brockton, Mass.

WAY Muffler Co. (The), 23d and Arch Sts., Philadelphia, Pa.

WESTERN Robe Co., Detroit, Mich.

CLUTCHES (Speed Changing)—(See Gears)

CLUTCHES

BLEVNEY, John C., 216 High St., Newark, N. J.

CARLYLE & Johnson Machine Co., Hartford, Conn.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich.

DOUBLE-Friction Coil Clutch Co., 45 Canal St., Chicago, Ill.

GARFORD Co. (The), Elyria, O.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 99).

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

MUNCIE Auto Parts Co., Muncie, Ind.

NATIONAL Brake & Clutch Co., Devonshire Bldg., Boston Mass (Cork Insert) (see page 63).

SMITH Co., A. O., Milwaukee, Wis.

SPEED Changing Pulley Co., 750 E. Washington St., Indianapolis, Ind. (see page 47).

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

UNIVERSAL Clutch Co., 226 S. 11th St., Philadelphia, Pa.

COLUMNS (See Water Alarms & Columns)

COMMUTATORS (See Controllers, Electric)

COMPRESSORS (Air)

CHICAGO Pneumatic Tool Co., 1010 Fisher Bldg., Chicago, Ill.

CROWELL, Gilmer, 292-296 Graham St., Brooklyn, N. Y.

FERODOWILL Mfg. Co., St. Paul, Minn.

HUMPHREYS Mfg. Co., Mansfield, Ohio.

KALISH Air Brake Co., 1317 Chestnut St., St. Louis, Mo.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

MARTIN & Anson Co., 2232 Cottage Grove Ave., Chicago, Ill.

NEW Era Gas Engine Co., 9 Dale Ave., Dayton, O.

PACIFIC Tucking & Mfg. Co., 471 18th St., Brooklyn, N. Y.

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page opposite).

VICTOR Electric Co., 55-61 Market St., Chicago, Ill.

WESTINGHOUSE Air Brake Co., Pittsburg, Pa.

COMPRESSORS (Register)

AUTO Novelty Co., Milwaukee, Wis.

CONDENSERS

CHICAGO Auto. Mfg. Co., 4230 State St., Chicago, Ill.

NATIONAL Oil Burner & Equipment Co., Holland Bldg., St. Louis, Mo.

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

WHITLOCK Coil Pipe Co. (The), Hartford, Conn. (see page 85).

CONNECTING RODS

ANDERSON Forge & Machine Co., Detroit, Mich.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

ERIE Forge Co., Erie, Pa.

GILL & Sons Forge & Machine Works, P. H., Brooklyn, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page opposite).

STANDARD Connecting Rod Co., Beaver Falls, Pa.

CONNECTORS, Wire (See Wire Terminals)

CONTROLLERS (Electric)

ELECTRIC Vehicle Equipment Co., 20th St. and Montgomery Ave., Philadelphia, Pa.

ELWELL-Parker Electric Co., 1076 Hamilton St., Cleveland, O.

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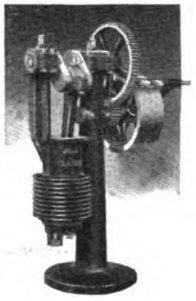

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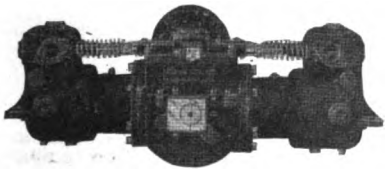

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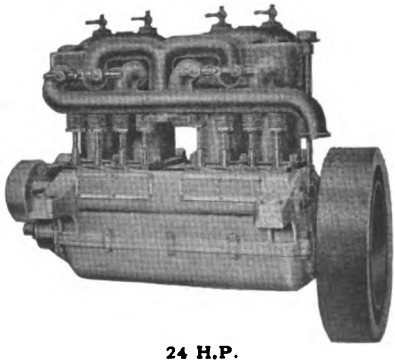

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GENERAL Electric Co., Schenectady, N. Y.

KNOBLOCK - Heideman Mfg. Co., South Bend, Ind.

LAMB & Co., Kent and Lyon Sts., Grand Rapids, Mich.

LINCOLN Electric Co., Cleveland, O.

McCUTCHEON Gear & Mfg. Co., 205 W. South St., Indianapolis, Ind.

WESTINGHOUSE Elec. & Mfg. Co., Pittsburg, Pa.

COOLERS (See Radiators)

CORK INSERTS (Brake and Clutch)

CONTINENTAL Motor Mfg. Co. (The), Muskegon, Mich.

NATIONAL Brake & Clutch Co., Devonshire Bldg., Boston, Mass. (see page opposite).

NORTHWAY Motor & Mfg. Co. (The), Detroit, Mich.

STANDARD Brake Co. (The), 101 W. 66th St., N. Y. City.

COUPLINGS (Brass)

(See Also Fittings—Pipe)

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

LUNKENHEIMER Co. (The), Cincinnati, O.

YOUSE, E. S., Reading, Pa.

COUPLINGS (Hose)

DOYLE Hose Union Co. (The), 810 Ann St., Homestead, Pa.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

MORGAN, B., Newport, R. I.

PITTSBURG Hose Connector Co., Pittsburg, Pa.

COVERS (Auto)

BURGIN Bros., Springfield, Mass.

DUANE & Co., W. & J., 1771 Broadway, N. Y. City.

GILBERT Mfg. Co., New Haven, Conn. (see page 149).

LANDERS Bros. Co., 445 10th St., Toledo, O.

MANHATTAN Auto Top Co., 249 W. 64th St., N. Y. City.

MUTTY Co., L. J., 267 Devonshire St., Boston, Mass. (page 157).

VEHICLE Apron & Hood Co., Columbus, O.

WILEY & Son Co., Wm. H., Box 30, Hartford, Conn. (see page 149).

CRANK SHAFTS

ANDERSON Forge & Machine Co., Detroit, Mich.

BILLINGS & Spencer Co., Hartford, Conn.

BLISS Co., E. W., Adams & Plymouth Sts., Brooklyn, N. Y.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 93).

ERIE Forge Co., Erie, Pa.

GILL & Sons, P. H., Forge & Mach. Wks., Brooklyn, N. Y.

LELAND, W. H., & Co., 6 Sheridan St., Worcester, Mass.

RICHMOND Forgings Corp., Richmond, Va.

STANDARD Connecting Rod Co., Beaver Falls, Pa.

STANDARD Welding Co., Cleveland, O.

TINDEL-MORRIS Co., Eddystone, Pa.

WYMAN & Gordon, 30 Bradley St., Worcester, Mass.

CRUCIBLES

BRIDGEPORT Crucible Co., Bridgeport, Conn.

DIXON, Jos., Crucible Co., Jersey City, N. J.

OBERMAYER Co., S. (The), 641 Evans St., Cincinnati, O.

WISCONSIN Graphite Co., Allegheny, Pa.

CUPS (Ball)

CROSBY Co. (The), Buffalo, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

NATIONAL Cycle Mfg. Co., Bay City, Mich.

WORCESTER Pressed Steel Co., Worcester, Mass.

CUPS AND CONES

CORBIN Screw Corporation (The), New Britain, Conn.

DETROIT Screw Works, Detroit, Mich.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

HARTFORD Machine Screw Co., 476 Capitol Ave., Hartford, Conn.

HOUGHTON & Buxton, Worcester, Mass.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

MATHEWS, H. A., Mfg. Co., Seymour, Conn.

NEW Britain Hardware Mfg. Co. (The), New Britain Conn.

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Patented **Clutches and Brakes** Patented

Will be used in 1907

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THE RAINIER CO.....New York, N. Y.
THE CLEVELAND MOTOR CAR CO.....Cleveland, Ohio.
THE STUDEBAKER AUTOMOBILE CO.....South Bend, Ind.

IN MULTIPLE DISC CLUTCHES BY:

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THE NORTHWAY MOTOR & MFG. CO.....Detroit, Mich.
THE JACKSON MOTOR CAR CO.....Jackson, Mich.

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THE NORDYKE & MARMON CO.....Indianapolis, Ind.
THE CONTINENTAL MOTOR MFG. CO.....Muskegon, Mich.
THE AMERICAN MACHINE MFG. CO.....Detroit, Mich.
THE DOLSON AUTOMOBILE CO.....Charlotte, Mich.
THE QUEEN MOTOR CAR CO.....Detroit, Mich.
THE FRONTENAC MOTOR CO.....Newburgh, N. Y.
THE BAY STATE AUTOMOBILE CO.....Boston, Mass.
THE MODEL AUTOMOBILE CO.....Peru, Ind.

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THE YORK MOTOR CAR CO.....York, Pa.
THE B-L-M MOTOR CAR CO.....Brooklyn, N. Y.
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The National Brake & Clutch Company has entered into a selling agency contract with the Standard Brake Company, No. 101 West 66th Street, New York, by which the Standard Brake Company will manufacture Cork Insert Clutches for the Trade and may arrange with manufacturers for Licenses from the National Brake & Clutch Company on precisely the terms granted others; this contract does not, however, prevent manufacturers from dealing directly with the National Brake & Clutch Company.

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PENINSULAR Milled Screw Co., Detroit, Mich.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WESTERN Automatic Machine Screw Co. (The), Elyria, O.

CURTAINS (Storm)

CURTAIN Supply Co., 85-93 Ohio St., Chicago, Ill.

ENEAS, A. G., 50 Congress St., Boston, Mass.

SPRAGUE Umbrella Co. (The), Norwalk, O. (see page 43).

CURTAIN FASTENERS

MURPHY Co., The G. W. J., Merrimac, Mass.

NEIDER Co., F. A. (The), Augusta, Ky. (see page 155).

ROEHM & Davison, Woodbridge and Wayne Sts., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

TAYLOR Co., H. D., 103-105 Oak St., Buffalo, N. Y.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WEISS & Son, Chas., 4725 Cottage Grove Ave., Chicago, Ill.

WING Co., Charles, Amesbury, Mass.

CUSHIONS

AUTO Top Co., Fort Wayne, Ind. (see page 153).

DETROIT Carriage Co., Detroit, Mich.

EMPIRE Gear & Top Co., 53 Mechanic St., Newark, N. J.

HALLIDAY, C. A., 42 Cedar St., Oneida, N. Y.

HILL Mfg. Co., 25 Fuller St., Buffalo, N. Y.

KELLEY, E., & Co., 509 Main St., Worcester, Mass.

LARRIMORE Buggy Top Co., Baltimore, Md.

MECHANICAL Fabric Co., Providence, R. I.

NEWTON, W. H. & Son, 127 Elm St., Cortland, N. Y.

PELINKA, Frank, 409 Blue Island Ave., Chicago, Ill.

PNEUMATIC Mattress & Cushion Co., 5 Fourth St., N. Y. City.

SPRINGFIELD Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass. (see page 153).

WARNER Pole & Top Co., 1655 Central Ave., Cincinnati, O.

CYCLOMETERS (See Indicators —Speed and Distance)

DASHES AND FENDERS

A-Z Co. (The), 527 West 56th St., N. Y. City.

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J. (see page 17).

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 123).

COLE & Woop, New York City.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 155).

DANN Bros. Co., New Haven, Conn.

DETROIT Auto Specialty Co., 909-911 Greenwood Ave., Detroit, Mich. (see page opposite).

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

EVERITT, B. F., Detroit, Mich.

FEDDERS Mfg. Co., Buffalo, N. Y. (see page 123).

GRAY & Sons, Peter, 90 Union St., Boston, Mass.

HALL, E. H. Co. (The), Inc., 12 Elm St., Rochester, N. Y.

HAYES Mfg. Co. (The), 360-370 Maybury Ave., Detroit, Mich. (see page 119).

INDIANAPOLIS Dash Co., Indianapolis, Ind.

KELLS, W. J., Mfg. Co., Jersey City, N. J. (see page 85).

KINSEY Mfg. Co. (The), Dayton, O. (see page 83).

LOCKE & Co., 218-220 West 84th St., New York.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

MAYO Radiator Co. (The), New Haven, Conn. (see page 125).

M'KINNON Dash Co., Buffalo, N. Y.

MOORE & Munger Co., 602 W. 52d St., New York.

NEW York Dash & Fender Co., 516-520 W. 36th St., N. Y. City.

PETERS & Herron Dash Co. (The), Columbus, O.

PURSELL Mfg. Co., P. M., 802 Beecher St., Indianapolis, Ind. (see page 85).

QUINBY & Co., J. M., Newark, N. J.

SPRINGFIELD Metal Body Co., 387 Birnie Ave., Brightwood, Mass. (see page 39).

WRIGHT Cooler & Hood Mfg. Co., 335 Wabash Ave., Chicago, Ill.

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The "Minute" clincher tire adjuster will actually take off or put on the **heaviest clincher tire in one minute** without injury to the shoe or inner tube and may be easily operated by a woman or child. The L & M ring tire adjuster is the only ring tire adjuster on the market. It consists of six tools which are slipped over the tire at intervals and by turning crank the tire is forced back from the ring all the way round, thus enabling you to put on or take off the ring with ease. **Write to-day for catalog and discount sheet.**

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Dealers Wanted.

Large Discounts.

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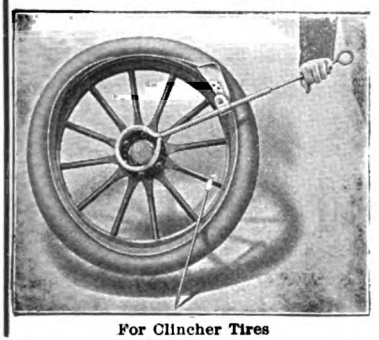

For Clincher Tires

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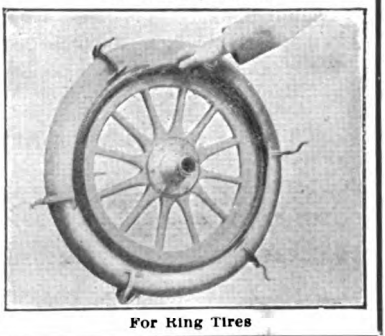

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It is a quick, lasting and absolutely non-inflammable, non-combustible polish compound that cleans and polishes as nothing else can.

AUTO SHINE is indispensable to owners of automobiles and yachts. It will do away with accidents caused through explosions.

AUTO SHINE will not evaporate even if the can should be left open.
AUTO SHINE will not settle, get hard, greasy or gummy.
AUTO SHINE has no obnoxious odor.
AUTO SHINE is the only safe liquid polish to use.

AUTO SHINE is handsomely put up in one-half pint, one pint, one quart and one gallon cans. For further particulars and prices write to

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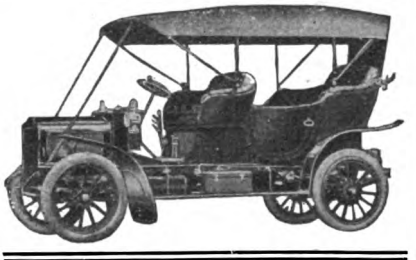

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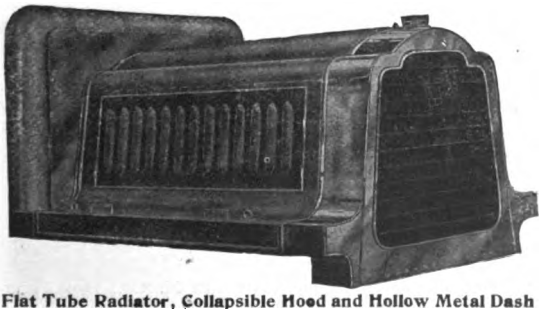

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BELDEN Machine Co., New Haven, Conn.

BETHLEHEM Steel Co., So. Bethlehem, Pa.

BILLINGS & Spencer Co., Hartford, Conn.

BLAKESLEE Forging Co., Plantville, Conn.

BLISS Co., E. W., Adams & Plymouth Sts., Brooklyn, N. Y.

BROOKEBANK, Mullin & Co., 409 Commerce St., Philadelphia, Pa.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 93).

CAPE Ann Tool Co., Pigeon Cove, Mass.

CHICAGO Drop Forge & Foundry Co., West Pullman, Ill.

CLAPP, E. D., Mfg. Co. (The), Auburn, N. Y.

CORLISS Engine Works, Providence, R. I.

CORTLAND Forging Co., Cortland, N. Y.

CRESCENT Forgings Co., Oakmont, Pa.

DETROIT Forging Co., Detroit, Mich.

DYSON, Jos. & Sons, Hamilton and Kirtland Sts., Cleveland, O.

EASTERN Forge Co., 70 Kilby St., Boston, Mass.

ECCLES, Richard, Auburn, N. Y.

FARIST Steel Co. (The), 137 E. Main St., Bridgeport, Conn.

GENERAL Railway Signal Co., 1738 Elmwood Ave., Buffalo, N. Y. (see page opposite).

GERHAB, Jacob, 158-164 No. 3d St., Philadelphia, Pa.

INDIANAPOLIS Drop Forging Co., Madison Ave. and Downey St., Indianapolis, Ind.

KEYSTONE Drop Forge Co., Chester, Pa.

KILBORN & Bishop Co. (The), New Haven, Conn.

KINGSTON Truck & Bolt Co., Kingston, N. Y.

MACHINERY Forging Co., Cleveland, O.

MICHIGAN Bolt & Nut Wks., Detroit, Mich.

MOORE Drop Forging Co., Springfield, Mass.

PAIGE-Storms Drop Forge Co., Chicopee Falls, Mass.

REVERE Drop Forge Co., Revere, Mass.

RICHMOND Forging Corporation, Richmond, Va.

RYMAN Co., K. L., 164 Market St., Newark, N. J.

SCRANTON Forging Co., Scranton, Pa.

SEWARD & Son Co., M., New Haven, Conn.

SMITH Co., A. O., Milwaukee, Wis.

SMITH, H. D., & Co., Plantsville, Conn.

SPRINGFIELD Drop Forging Co., Springfield, Mass.

STRIEBY & Foote Co., 301 Ogden St., Newark, N. J.

TRASNUE & Williams Co. (The), Alliance, Ohio.

UNION Drop Forge Co., 64-76 E. Ohio St., Chicago, Ill.

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WHITMAN & Barnes Mfg. Co., Akron, O.

WILCOX, D., Mfg. Co., Mechanicsburg, Pa.

WILLIAMS, J. H., & Co., Brooklyn, N. Y.

WORCESTER Pressed Steel Co., Worcester, Mass. (cold).

WYMAN & Gordon, 30 Bradley St., Worcester, Mass.

DUST RINGS

BOOTH, N. E., 743-45 39th St., Brooklyn, N. Y. (see page 177).

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BROWN, W. H., Lennox Bldg., Cleveland, O

GODDARD & Allen, Rockford, Ill.

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

WILEY & Son Co., Wm. H., Box 30, Hartford, Conn. (see page 149).

DYNAMOS (See Generators)

EJECTORS

LOCKE Regulator Co., Salem, Mass.

PENBERTHY Injector Co., Detroit, Mich.

RUE Mfg. Co., 215 Race St., Philadelphia, Pa.

SHERWOOD Mfg. Co., Buffalo, N. Y.

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EATON & Prince, 76 Mich. St., Chicago, Ill.

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NEW Amer. Elevator Co. (The), Curtis and Jefferson Ave., Columbus, O.

OTIS Elevator Co., Railway Exchange, Chicago, Ill.

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ABBEY & Co., P. L., Kalamazoo, Mich.

U. S. EMERGENCY Case Co., Utica, N. Y.

ENAMEL

ACME White Lead & Color Wks., Detroit, Mich.

ADAMS & Elting Co., 155 W. Washington St., Chicago, Ill.

AMERICAN Enamel Co., Providence, R. I.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (see page 79).

BERRY Bros., Ltd., Detroit, Mich. (see front cover).

BUFFALO Enamel & Stain Co., 70-72 W. Genesee St., Buffalo, N. Y.

COLOPHITE Co. (The), New Haven, Conn.

DETROIT White Lead Wks., 532 E. Milwaukee Ave., Detroit, Mich.

DITZLER Color Co., 14 Baltimore Ave. W., Detroit, Mich.

FELTON, Sibley & Co., 136-140 North Fourth St., Philadelphia, Pa.

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RUBBER Paint Co., 154-156 W. Van Buren St., Chicago, Ill.

SHERWIN-Williams Co., 100 Canal St., Cleveland, O.

STANDARD Varnish Works, 29 B'way, N. Y. City (see page 165).

VALENTINE & Co., 257 Broadway, N. Y. City.

WATTS-De Golyer Co. (The), 377-391 Illinois St., Chicago, Ill.

ENGINES (Gasoline)
(See Motors, Gasoline)

ENGINES (Steam)

ABELL, Rollin, 370 Atlantic Ave., Boston, Mass.

DIETER Steam Engine Co., 106 Liberty St., New York.

ESTY, Wm., 59 Mill St., Laconia, N. H.

HILBURN, Edwin, Spring Valley, Minn.

LAKEPORT Mfg. Co., Lakeport, N. H.

MASON Regulator Co., 158 Summer St., Boston, Mass.

MILNE, Frank, Crescent St., Everett, Mass.

NADIG, C. H., & Bro., Mfg. Co., 16-24 No. 4th St., Allentown, Pa.

RACINE Engine & Iron Wks., Racine, Wis.

RANDALL, G. N., 1094 French St., Meadville, Pa.

ROCHESTER Machine Tool Wks., Ltd., Rochester, N. Y.

SANTA Ana Machine & Foundry Co., Santa Ana, Cal.

SMITH, Wm. J., New Haven, Conn.

WILLIAMS Co. (The), John, 114-118 Liberty St., N. Y. City.

EYE SHIELDS

AMERICAN Thermo-ware Co., 16 Warren St. (Importers), New York.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

CHICAGO Eye Shield Co., 112 Randolph St., Chicago, Ill.

EHRLICH & Son, J., 1345 Broadway, N. Y. City.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page opposite).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

GLOBE Optical Co., Boston, Mass.

LLOYD, A. J., & Co., 323 Washington St., Boston, Mass.

MEYROWITZ, E. B., 104 E. 23d St., N. Y. City.

MILLER, Chas. E. (Importer), 97 Reade St., N. Y. City.

MILLS Mfg. Co., 1368-1370 Broadway, N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

MUNSELL & Co., Eugene, 218 Water St., N. Y. City.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

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OELSCHLAGER Bros., 42 E. 23d St., N. Y. City.

OPTHALMUSCOPE Co., Toledo, O.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co., (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

SCHEIDIG & Co., John, 50 Maiden Lane, N. Y. City.

SPENCER Optical Mfg. Co., 15 Maiden Lane, N. Y. City.

SUSSFIELD, Lorsch & Co., 37 Maiden Lane, N. Y. City.

TEXAS Co. (The), Chicago, Ill.

FELT WASHERS

BOOTH, N. E., 743-45 39th St., Brooklyn, N. Y. (see page 177).

FIRE EXTINGUISHERS

BADGER Chemical Mfg. Co., 143 Reed St., Milwaukee, Wis.

BADGER Fire Extinguisher Co. (The), 32 Portland St., Boston, Mass.

CHILDS Co., O. J., Utica, N. Y.

HARRIS Safety Co., N. Y. City.

HAVERHILL Fire Appliance Co., Haverhill, Mass.

HOWE, G. S. & A. J., Co., 117 Exchange St., Worcester, Mass.

LANDAU, Henry W., 117 Green St., Newark, N. J. (see page opposite).

LITTLE Giant Mfg. Co., 88 Wall St., N. Y. City.

MONARCH Fire Appliance Co., 249 Pearl St., New York City.

NEVERMISS Fire Extinguisher Co., Middletown, N. Y.

PHOENIX Appliance Co., 15 W. 28th St., N. Y. City.

ROCKFORD-Kalamazoo Fire Extinguisher Co., 424 Ashton Bldg., Rockford, Ill.

STEMPEL Fire Apparatus Mfg. Co., 4520 N. 20th St., St. Louis, Mo.

SUFFOLK Chemical Co., 174 Summer St., Boston, Mass. (see page opposite).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

FITTINGS (Pipe, Brass)

BARRETT Mfg. Co., James, Boston, Mass.

BELFIELD & Co., H., Philadelphia, Pa.

BELKNAP Mfg. Co., Bridgeport, Conn

BEST Manufacturing Co., Pittsburg, Pa.

BUCKEYE Iron & Brass Works, Dayton, O.

CENTRAL Brass Works, Cincinnati, Ohio.

CHAMBERS & Ainslee, Newark, N. J.

CRANE Co., Chicago, Ill.

DALTON-INGERSOLL Co., Boston, Mass.

DARLING Pump & Mfg. Co., Williamsport, Pa.

DETROIT Lubricator Co., Detroit, Mich.

DETROIT Sanitary Supply Co., Detroit, Mich.

EASTWOOD Wire Mfg. Co., Belleville, N. J.

EATON, Cole & Burnham Co., New York, N. Y.

FEWLESS-Leen Brass & Iron Co., Cincinnati, O.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

HAMLIN & Emery Brass Co., Boston, Mass.

HAYDENVILLE Co., Haydenville, Mass.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

HOFFMAN & Billings Manufacturing Co., Milwaukee, Wis.

HUMPHREYS Mfg. Co., Mansfield, O.

IDEAL Manufacturing Co., Detroit, Mich.

ILLINOIS Malleable Iron Co., Chicago, Ill.

IMPERIAL Brass Mfg. Co., 251 So. Jefferson St., Chicago, Ill.

JARECKI Manufacturing Co., Erie, Pa.

KINSEY & Mahler Co., Peoria, Ill.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

LUNKENHEIMER Co. (The), Cincinnati, O.

McDONALD & Morrison Manufacturing Co., A. Y., Dubuque, Iowa.

McNAB & Harlin Mfg. Co., New York, N. Y.

McRAE & Roberts Co., 227-235 Campbell Ave., Detroit, Mich.

MANSFIELD Manufacturing Co., Pittsburg, Pa.

MASON Regulator Co., Boston, Mass.

MILWAUKEE Brass Mfg. Co., Milwaukee, Wis.

MULLANEY'S Sons, Jas., New York, N. Y.

NEW Britain Brass Co., New Britain, Conn.

PETRIE, John, New Haven, Conn.

PIONEER Brass Works, Indianapolis, Ind.

PITTSBURG Valve & Fittings Co., Pittsburg, Pa.

PLEUGER & Henger Mfg. Co., 11th and Herbert Sts., St. Louis, Mo.

POWELL Co., Wm., Cincinnati, Ohio.

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Downey's 90-H.P. Mercedes that was burned at the Readville Races could have been saved with

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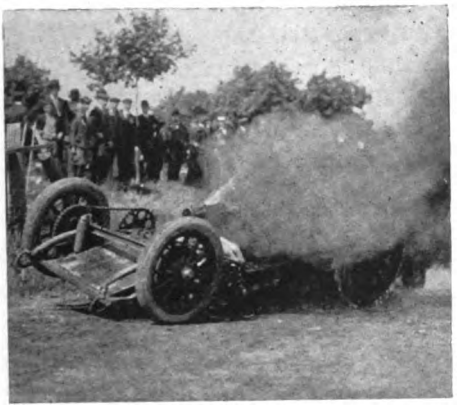

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Fire is liable to happen at the most unexpected times on the road or in the garage. Insure your car with the **Lightning Fire Extinguisher.**

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Short tube, 20 inches, for Carrying in Car, ... $1.00

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GARAGES It is to your interest and your duty to your customers to provide Fire Protection. As a SPECIAL OFFER for the next 30 DAYS we will sell you the Lightning Fire Extinguisher, f. o. b. Boston at $8 50 per dozen.

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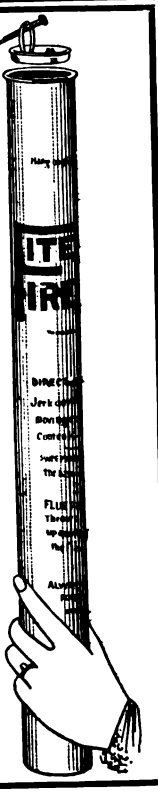
22 in. long; 2 in. diameter; weight 3 pounds; equal to 120 gallons of water; generates Nitrogen gas, which is an absolute non-supporter of combustion; guarantee to refill free of charge at any time when used in actual fire emergency. Send for circular and letters of people that have had fires and used "Fite Fire," the only extinguisher that can do what a liquid can't do.



"Fite Fire" equipment on thousands of cars; equip yours and feel safe. Eighty-seven per cent. of Auto Garages have had fires in 1905 "Fite Fire" does not freeze, corrode, explode, deteriorate, or get out of order; last indefinitely. Buy now before it's too late.

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POWHATTAN Brass & Iron Wks., Charlestown, W. Va.

QUEEN City Brass & Iron Works, Cincinnati, O.

REGESTER'S Sons Co., J., Baltimore, Md.

ROSE, Clarence H., 1905 Park Row Bldg., N. Y. City.

RUNDLE-Spence Mfg. Co., Milwaukee, Wis.

SPEAKMAN Supply & Pipe Co., Wilmington, Del.

STANDARD Sanitary Mfg. Co., Pittsburg, Pa.

STEBBINS Mfg. Co., E., Springfield, Mass.

THOMAS Brass and Iron Co., Waukegan, Ill.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WALWORTH Manufacturing Co., Boston, Mass.

WESTERN Tube Co., Kewanee, Ill.

FLOATS (Ball)

DIAMOND Stamped Ware Co., Detroit, Mich.

HERCULES Float Co., Springfield, Mass.

NAUGATUCK Mfg. Co., Naugatuck, Conn.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

FOOT RESTS

BURROWS Co., E. T., Portland, Me.

RANDS Mfg. Co., 51 Macomb St., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

WARNER Pole & Top Co., 1655 Central Ave., Cincinnati, O.

FOOT WARMERS (See Heaters)

FORGE EQUIPMENT

AMERICAN Blower Co., Detroit, Mich.

AMER. Gas. Furnace Co., 23 John St., N. Y. City.

BILLINGS & Spencer, Hartford, Conn.

BOYNTON & Plummer, Worcester, Mass.

BUFFALO Forge Co., Buffalo, N. Y.

INGERSOLL-Sargeant Drill Co., N. Y. City.

MINER & Peck Mfg. Co., New Haven, Conn.

STURTEVANT Co., B. F., Boston, Mass.

FRAMES (Pressed Steel)

AMERICAN & British Mfg. Co., Bridgeport, Conn.

CLEVELAND Car Specialty Co., Cleveland, Ohio.

CLEVELAND City Forge & Iron Fdry. Co., Cleveland, O.

KINSEY Mfg. Co., Dayton, O. (see page 83).

MIDGLEY Mfg. Co., Columbus, O.

PARISH Mfg. Co., Reading, Pa.

PARRISH & Bingham, Cleveland, O.

SMITH Co., A. O., Milwaukee, Wis.

STANDARD Pressed Steel Co., Philadelphia, Pa.

TURL'S Sons, John, 534 W. 28th St., N. Y. City.

FRICTION CLUTCHES (See Gears)

FUEL (Non-Explosive, Non-Corrosive)

BARITE Co., 527 Fifth Ave., New York, Night and Day Bank Bldg. (see page opposite).

FUNNELS (Gasoline)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co. 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

A-Z Co. (The), 527 West 56th St., N. Y. City.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo.. (Dealers and Jobbers) (see page 27).

BREEZE Motor Mfg. Co., 33 Court St., Newark, N. J.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 93).

DOVER Stamping & Mfg. Co., 381 Putnam Ave., Cambridge, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co. 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

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INCREASES Horse-Power of Motor.

PREVENTS Carbon Deposit, Pitting and Corrosion.

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GRAY & Sons, Peter, 90 Union St., Boston, Mass.

IVER Johnson Sporting Goods Co., Boston, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

TALIAFERRO, W. T., 258 Broadway, N. Y. City.

WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill. (see page 145).

GALVANIZING

BRISCOE Mfg. Co., Detroit, Mich. (see page 123).

U. S. Electro-Galvanizing Co., 1-9 Park Ave., Brooklyn, N. Y.

GASKETS

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

GOODWIN & Kintz Co., Winsted, Conn.

HERZ & Co. (Importers), 203-205 Lafayette St., N. Y. City.

JOHNS-Manville Co., H. W., 100 William St., New York.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

McCORD & Co., Old Colony Bldg., Chicago, Ill. (see page 31).

MORSE, R. F., 74 Weybosset St., Providence, R. I.

N. J. Asbestos Co., Camden, N. J.

REPUBLIC Belting & Supply Co., Cleveland, Ohio.

U. S. Indestructible Gasket Co., 8 So. William St., New York.

U. S. Mineral Wool Co., N. Y. City.

GATES (Driveway)

MANLOVE Gate Co., 272 Huron St., Chicago, Ill.

GAUGES (Gasoline Tanks)

AMERICAN Steel Barrel Co., 204-206 Varet St., Brooklyn, N. Y.

BOSTON Auto Gage Co., 613 Old South Bldg., Boston, Mass. (see page opposite).

BLOOD Bros. Mach. Co., Kalamazoo, Mich.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page opposite).

KINSEY Mfg. Co., Dayton, O. (see page 83).

MARTIN, M. A., 518 W. 63d St., Chicago, Ill.

OHIO Brass Co., Mansfield, O.

ROSS Engineering Co., 97 S. Clinton St., Chicago, Ill.

RUTENBER Co., Chicago, Ill.

SIMMONS, John, Co., 104-110 Centre St., N. Y. City.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WEBSTER Mfg. Co., 261 Jefferson Ave., Detroit, Mich. (see page 145).

GAUGES (Pressure)

AMERICAN Steam Gauge & Valve Mfg. Co., Jamaica Plains, Boston, Mass.

ASHCROFT Mfg. Co., 87 Liberty St., N. Y.

ASHTON Valve Co., 271 Franklin St., Boston, Mass.

AUTO Novelty Co., Milwaukee, Wis.

BOSTON Steam Specialty Co., 168-170 Congress St., Boston, Mass.

CROSBY Steam Gage & Valve Co., 97 Oliver St., Boston, Mass.

PITTSBURG Gauge & Supply Co., 309 Water St., Pittsburg, Pa.

SCHAEFER & Budenburg Mfg. Co., Foxboro, Mass.

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

WRAY Pump & Register Co., Rochester, N. Y.

GAUGES (Water Line)

AMERICAN Steam Gauge & Valve Mfg. Co., Jamaica Plain, Boston, Mass.

KNOWLSON & M'Conihe, 65 River St., Troy, N. Y.

RELIABLE Water Gauge Co., 1616 Pine St., St. Louis, Mo.

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

GEAR BLANKS

DETROIT Screw Works, Detroit, Mich.

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Non-Fluid Oils have unusually valuable lubricating qualities in addition to their ***dripless*** properties. You can get plenty of greases that won't drip to be sure, but——! It will pay you to use the genuine **Non-Fluid Oils.**

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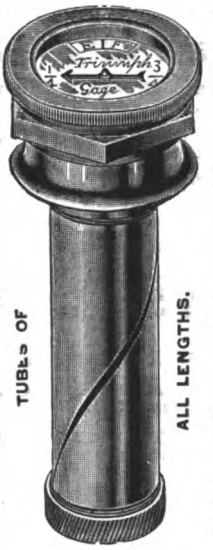

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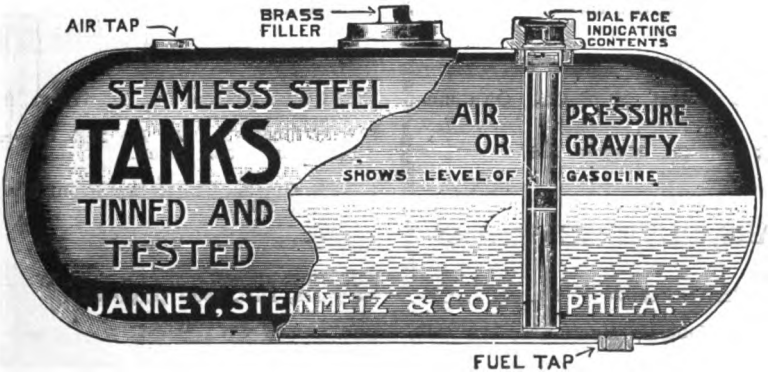

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AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

BRIDGEPORT Deoxidized Bronze & Metal Co., Bridgeport, Conn.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

GARFORD Co. (The), Elyria, O.

LIGHT Mfg. & Fdry. Co., Pottstown, Pa.

MICHIGAN Brass Mfg. Co. (The), 74-78 Fort St. E., Detroit, Mich.

NIAGARA Falls Brass Works, Inc., Niagara and Virginia Sts., Buffalo, N. Y. (see page 55).

PIONEER Brass Wks., Indianapolis, Ind.

SYRACUSE Aluminum & Bronze Co., Syracuse, N. Y. (see page 53).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

GEARS (Differential)

BOSTON Gear Wks., Norfolk Downs, Mass.

BROWN-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y. (see page opposite).

BULTMAN & Co., F. H., 131 Viaduct, Cleveland, O.

CULLMAN Wheel Co., 1030 Dunning St., Chicago, Ill. (see page 119).

GARFORD Co. (The), Elyria, O.

GRANT Gear Wks., 6 Portland St., Boston, Mass.

GRAY-Hawley Mfg. Co., 605-609 Fort St. W., Detroit, Mich.

MUNCIE Auto Parts Co., Muncie, Ind.

VIRTUE & Pound Mfg. Co., Owatonna, Minn.

WARNER Gear Co., Muncie, Ind.

GEARS, REVERSE (Marine)

BRODIE, Wm. H., 45 Vesey St., N. Y. City.

CARLYLE & Johnson Mach. Co., Hartford, Conn.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich.

GEARLESS Transmission Co., Rochester, N. Y.

N. Y. Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.

TUTTLE Mfg. Co., H. A., So. Norwalk, Conn.

GEARS (Transmission)

AMERICAN Die & Tool Co., Reading, Pa.

BELDEN Auto Transmission Co., 1005 Bessemer Bldg., Pittsburg, Pa.

BEVERLY Mfg. Co., Beverly, Mass.

BOSTON Gear Works, Norfolk Downs, Mass.

BROWN-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y. (see page opposite).

BULTMAN & Co., F. H., 131 Viaduct, Cleveland, O.

CARLYLE & Johnson Machine Co., Hartford, Conn.

CLEMICK-Hirsch Co., 594-596 National Ave., Milwaukee, Wis.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich.

FORT Wayne Gear Co., Fort Wayne, Ind.

GARFORD Co. (The), Elyria, O.

GEARLESS Transmission Co., Rochester, N. Y.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page opposite).

LAUTH & Co., J., 528 Elston Ave., Chicago, Ill.

LEE Mfg. Co. (The), South Park, Port Huron, Mich.

MILWAUKEE Auto. Engine & Supply Co., 706 Winnebago St., Milwaukee, Wis.

MILWAUKEE Motor Co., Milwaukee, Wis.

MUNCIE Auto Parts Co., Muncie, Ind.

NEW York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.

PHILLIPS Motor Wks., W. L., 405 Tacoma Bldg., Chicago, Ill.

PURITAN Machine Co., 12 Gratiot Ave., Detroit, Mich.

REDINGTON, F. B., & Co., 107-109 S. Sangamon St., Chicago, Ill.

ROSS Gear & Tool Co., Lafayette, Ind.

SHATTUCK Co., W. P., 2125 Girard Ave., So. Minneapolis, Minn.

SINTZ, Guy L., Fulton and Front Sts., Grand Rapids, Mich.

SMITH Co., A. O., Milwaukee, Wis.

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page 51).

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

SYRACUSE Gear Co., Syracuse, N. Y.

TORBENSEN Motor Car Co., Bloomfield, N. J.

TREBERT Gas Engine Co., 163 165 Main St. W., Rochester, N. Y.

VIRTUE & Pound Mfg. Co., Owatonna, Minn.

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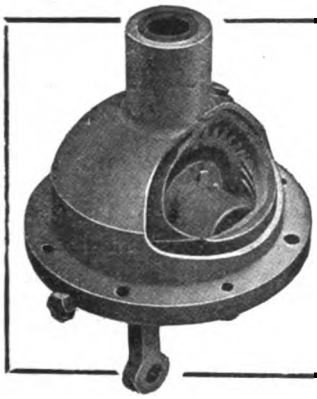

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Steering (Back-Lock)
Sliding Gear Transmissions

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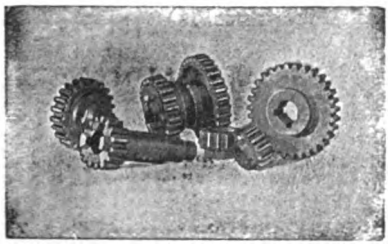

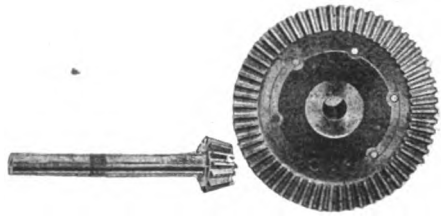

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SPIRAL GEARS, HERRINGBONE GEARS,
ANGLE GEARS AND RACKS.

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Difficult Stamping and Drawing

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WARNER Gear Co., Muncie, Ind.

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WESTERN Motor Co. (The), Logansport, Ind.

GEAR WHEELS (Metal)

ADAPT Machinery Co. (The), 17th St. and Wabash Ave., Chicago, Ill.

ARTHUR Co. (The), 188 Front St., N. Y. City.

BOSTON Gear Works, Norfolk Downs, Mass.

BULTMAN, F. H., & Co., 131 Viaduct, Cleveland, O.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

CULLMAN Wheel Co., 1030 Dunning St., Chicago, Ill. (see page 119).

DETROIT Screw Works, Detroit, Mich.

FELLOWS Gear Shaper Co. (The), Springfield, Vt.

MUNCIE Auto Parts Co., Muncie, Ind.

NEW Process Rawhide Co., Syracuse, N. Y. (see page 77).

NUTTALL, R. D., Co., Fayette St. and Garrison Way, Pittsburg, Pa.

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page 51).

WARNER Gear Co., Muncie, Ind.

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

GEAR WHEELS (Rawhide)

CHICAGO Rawhide Mfg. Co., 75-77 Ohio St., Chicago, Ill.

HORSBURGH & Scott Co., Cleveland, O.

MUNSON, Chas., Belt Co., 88 Franklin St., Chicago, Ill.

NEW Process Rawhide Co., Syracuse, N. Y. (see page 77).

PICROME Hide Co., Syracuse, N. Y.

SYRACUSE Rawhide Mfg. Co., Niagara and Shonnard Sts., Syracuse, N. Y.

GENERATORS (Electric)

AMERICAN Coil Co., Foxboro, Mass.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 41).

EDDY Electric Mfg. Co. (The), Windsor, Conn.

ELBRIDGE Electric Co., Elbridge, N. Y.

GENERAL Electric Co., Lynn, Mass.

LAMB Electric Co., 31 Canal St., Grand Rapids, Mich.

MILWAUKEE Electric Co., Milwaukee, Wis.

NEW England Motor Co., Liberty Square, Lowell, Mass. (see page 33).

ROTH Bros. & Co., 27-29 S. Clinton St., Chicago, Ill.

SPRAGUE Electric Co., 527 W. 34th St., N. Y. City.

STERLING Electric Motor Co., Dayton, O.

WAGNER Electrical Mfg. Co., St. Louis, Mo.

WESTINGHOUSE Co., 10 Bridge St., N. Y. City.

WRIGHT, Thomas, Co. (The), 406-410 Grand St., Jersey City, N. J.

GLASS FRONTS (See Wind Shields)

GLOVES AND GAUNTLETS

AMERICAN Glove Co. (The), 18 Churchill St., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page opposite).

AUTOMOBILE Equipment Co. (The), 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BELOIT Glove & Mitten Co., 217 Grand Ave., Beloit, Wis.

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

CLARK Glove Co., Peabody, Mass.

CROSBY, Frisin, Fur Co., 116 Mill St., Rochester, N. Y.

DEMMERLE & Co., 248 W. 23d St., N. Y. City.

DETROIT Leather Specialty Co., Detroit, Mich. (see page opposite).

EISENDRATH Glove Co., Armitage and Elston Ave., Chicago, Ill.

ELLSWORTH & Thayer Mfg. Co., Milwaukee, Wis.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

HANSEN, O. C., Mfg. Co., 356 E. Water St., Milwaukee, Wis. (see page opposite).

HEAGLE, James, Cor. First Ave. and Market St., Johnstown, N. Y.

KIBBE, C. S., Batavia, N. Y.

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MORAWETZ Co. (The), Milwaukee, Wis.

MORRISON, McIntosh & Co., 63 Broad St., Grinnell, Ia. (see page 79).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

PONTIAC Knitting Co., Pontiac, Mich.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co., (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

RIPON Knitting Wks., Ripon, Wis.

SAKS & Co., Broadway and 34th St., N. Y. City.

SYRACUSE & Eldridge Gloves Co., 924 S. Salina St., Syracuse, N. Y.

GOGGLES (See Eye Shields)

GONGS (See Bells)

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DIXON, Jos., Crucible Co., Jersey City, N. J.

HOLMES Fibre Graphite Co., 5155 Wakefield St., Philadelphia, Pa.

NATIONAL Cement & Rubber Mfg. Co., 3053-59 Monroe St., Toledo, O.

OBERMAYER Co. (The) S., Cincinnati, O.

UNITED States Graphite Co., Saginaw, E. S., Mich.

WISCONSIN Graphite Co., Allegheny, Pa.

GREASE

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BESLEY & Co., C. H., Chicago, Ill.

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

COLUMBIA Lubricants Co. of New York, 78 Broad St., New York (see page 113).

DOWNING Grease Co., 14 Waltham St., Boston, Mass.

EAGLE Oil & Supply Co., 104 Broad St., Boston, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FISKE Bros. Refining Co., 13-15 Old Slip, New York (see page opposite).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

HARRIS, A. W., Oil Co., 330 S. Water St., Providence, R. I. (see back cover).

KELLOGG, E. H. Co., 243-244 South St., New York City.

KEYSTONE Lubricating Co., 20th and Allegheny Ave., Philadelphia, Pa.

MILLER'S Sons, Wm. P., 75-79 Third St., Long Island City, N. Y.

MONARCH Mfg. Co., Toledo, O.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NATIONAL Cement and Rubber Mfg. Co., Toledo, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

N. Y. and N. J. Lubricant Co., 14 Church St., New York City (see page 75).

PARAGON Refining Co. (The), Toledo, O.

PHILA. Grease Mfg. Co., The Bourse, Philadelphia, Pa.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page opposite).

RELIANCE Oil & Grease Co., 12 S. Water St., Cleveland, O.

SULLIVAN Oil Co., Chicago, Ill.

WISCONSIN Graphite Co., Allegheny, Pa.

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AMERICAN Injector Co., Detroit, Mich.

AMERICAN Lubricator Co., Detroit, Mich.

BOWEN Mfg. Co., Auburn, N. Y.

DETROIT Lubricator Co., Lincoln Ave. and G. T. R. R., Detroit, Mich.

ESSEX Brass Co., G. B., 480 Franklin St., Detroit, Mich.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

LUNKENHEIMER Co. (The), Cincinnati, O.

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WINKLEY Co. (The), Detroit, Mich.

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ARMOUR Curled Hair Wks., Chicago, Ill.

BAEDER, Adamson & Co., 67 Beekman St., N. Y. City.

BENTLEY Hair Co., Joseph, Methuen, Mass.

MITCHELL, P. R. Co. (The), Spring Grove & Harrison Aves., Cincinnati, O.

HAMPERS

AMER. Basket Factory, 480 S. Center Ave., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co. (The), 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BAILIE Basket Co., 85 Hudson St., Boston, Mass.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BOSTON Mat & Basket Co., 62 Fulton St., Boston, Mass.

BURLINGTON Basket Co., Burlington, Ia.

CURADO Willow Ware Co., 1524 Frankford Ave., Philadelphia, Pa.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FONTAINE, R. A., 342 Gratiot Ave., Detroit, Mich.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

HEYWOOD Bros. & Wakefield Co., 174 Portland St., Boston, Mass.

KEYSTONE Willow Mfg. Co., 700 Green St., Philadelphia, Pa.

M. & A. Basket Co., 239 E. 27th St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

MYERS & Alexander, 239 E. 27th St., N. Y. City.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

POUGHKEEPSIE Art Pulp Co., 110 Mill St., Poughkeepsie, N. Y.

RATTAN Mfg. Co., 522 State St., New Haven, Conn.

SCHERER, Williams Co., 30 Lewis Wharf, Boston, Mass.

UNION Carriage & Rattan Co., Ohio Falls, Ind.

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CHICAGO Flexible Shaft Co., La Salle Ave. and Ontario St., Chicago, Ill.

LEHMAN Bros., 10 Bond St., N. Y. City.

MOTOR Car Heater Co., 21 Quincy St., Chicago, Ill.

NOVELTY Mfg. So., Jackson, Mich.

OLMSTED & Son, H. R., 413 S. Clinton St., Syracuse, N. Y.

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STANDARD Stamping Co., Marysville, O.

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KILBURN, Edwin, Spring Valley, Minn.

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NORRIS Mfg. Co., 27 Western Ave., Cambridge, Mass.

RANLET Automobile Co., St. Johnsbury, Vt.

WHITLOCK Coil Pipe Co., Hartford, Conn. (see page 85).

HEATERS (Torch)

FOSTER & Brown, Westbrook, Me.

MORAN Flexible Steam Joint Co., Louisville, Ky.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

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ENGLISH & Mersick Co., New Haven, Conn.

RUMPP & Sons, C. F., Philadelphia, Pa.

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BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 123).

DETROIT Auto Specialty Co., 909-911 Greenwood Ave., Detroit, Mich. (see page 65).

DIAMOND Stamped Ware Co., Detroit, Mich.

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

FEDDERS Mfg. Works, Buffalo, N. Y. (see page 123).

HAYES Mfg. Co. (The), 360-370 Maybury Ave., Detroit, Mich. (see page 119).

KELLS, W. J., Mfg. Co., Jersey City, N. J. (see page opposite).

KINSEY Mfg. Co., Dayton, O. (see page 83).

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

LONG-Turney Mfg. Co., Rome, N. Y.

MAYO Radiator Co. (The), New Haven, Conn. (see page 125).

MOORE & Munger Co., 602 W. 52d St., New York.

PURSELL Mfg. Co., P. M., 802 Beecher St., Indianapolis, Ind. (see page opposite).

SPRINGFIELD Metal Body Co., 397 Birnie Ave., Brightwood, Mass. (see page 39).

WHITLOCK Coil Pipe Co. (The), Hartford, Conn. (see page opposite).

WRIGHT Cooler & Hood Mfg. Co., 335 Wabash Ave., Chicago, Ill.

HORNS

ACORN Brass Mfg. Co., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co. 264 Jefferson Ave., Detroit, Mich. (Dealers bers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

AUTOMOBILE Supply Mfg. Co., 139 Emerson Place, Brooklyn, N. Y.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co. 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

FUNKE, A. H., 83 Chambers St., New York.

GLEASON-Peters Air Pump Co., Mercer and Houston Sts., N. Y. City.

HUTCHINSON Electric Horn Co., N. Y. City.

MANHATTAN Screw & Lamp Co., 7th Ave, and 11th St., N. Y. City.

McPHILLIPS Horn Mfg. Co., 255 Jefferson Ave., Detroit, Mich.

MILLER, Charles E., 97-101 Reade St., New York (Importer).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

O'BRIEN Electrophone Co., Augusta, Me.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

RILEY-Klotz Mfg. Co., Newark, N. J.

ROSS Engineering Co., 97 S. Clinton St., Chicago, Ill.

RUBAY, Leon, 136 W. 38th St., N. Y. City (Importers).

SCHOENING, M. E., 369 Broadway, New York City (Importers).

STEVENS & Co., 99 Chambers St., N. Y. City.

STEWART & Clark Mfg. Co., 69 Wells St., Chicago, Ill. (see page 35).

20TH Century Mfg. Co., 19 Warren St., New York.

VESTA Accumulator Co., 1334 Michigan Ave., Chicago, Ill.

HORNS (Exhaust)

GABRIEL Horn Mfg. Co., 934 Hamilton Ave., N. E., Cleveland, O. (see page 87).

GAS Engine Whistle Co., 1123 Broadway, N. Y. City.

GRAY-Hawley Mfg. Co., 605-609 Fort St., W., Detroit, Mich.

NEW Jersey Tube Co., Newark, N. J.

TRINITY Chimes Co. (The), 29 N. Capitol Ave., Indianapolis, Ind.

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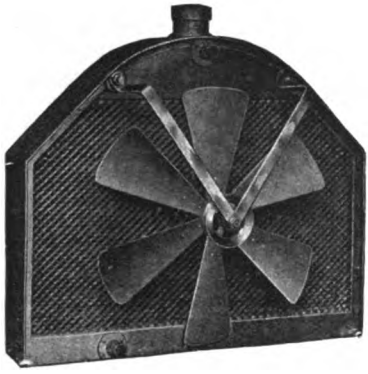

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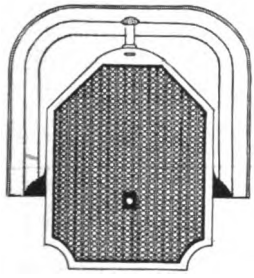

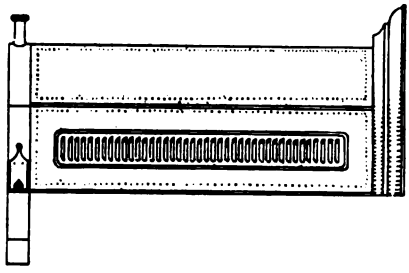

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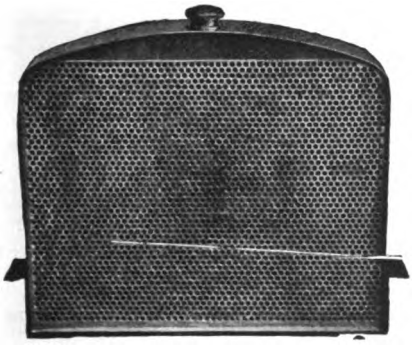

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AUBURN Ball Bearing Co., Rochester, N. Y.

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CROSBY Co. (The), Buffalo, N. Y.

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KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

NIAGARA Falls Brass Works, Inc., Niagara and Virginia Sts., Buffalo, N. Y. (see page 55).

TORREY Roller Bushing Works, Bath, Me.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WORCESTER Pressed Steel Co., Worcester, Mass.

HUB FLANGES

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

CROSBY Co. (The), Buffalo, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

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AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

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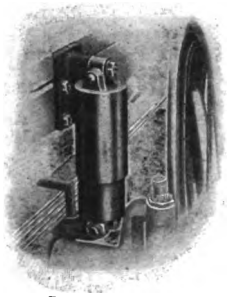
"SHOCK ELIMINATORS"



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FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

GREINER, Emil, 45 Cliff St., New York.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

POPE Mfg. Co., Hartford, Conn (Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Importers) (see page 81).

SCIENTIFIC Shop (The), 1230 Monon Bldg., Chicago, Ill.

TAYLOR Bros. Co., Rochester, N. Y.

VUILLE, Chas. A., Huntington, Pa.

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ALTEMUS & Co., C. L., 15th and Market Sts., Philadelphia, Pa.

AMERICAN Coil Co., Foxboro, Mass.

BOSCH, Robert, 1945 Broadway, N. Y. City.

CARLISLE & Finch Co. (The), 223 E. Clinton Ave., Cincinnati, O.

CLIMAX Igniter Co., Amesbury, Mass.

D.-K. Electric Co., 222 Chestnut St., St. Louis, Mo.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 41).

DRAKE Electric Co., 1305 Michigan Ave., Chicago, Ill.

ELBRIDGE Electrical Mfg. Co., Elbridge, N. Y.

GILBOUGH, B. G., 36 La Salle St., Chicago, Ill.

HERCULES Elec. and Mfg. Co., 709 Langsdale Ave., Indianapolis, Ind. (see page 151).

HERZ & Co., 203-205 Lafayette St., N. Y. City.

HOLLEY Bros. Co., 675 Beaubien St., Detroit, Mich.

HOLTZER-Cabot Electric Co., Brookline, Mass.

IGNITER Appliance Co., 133 Central Ave., Cleveland, O. (see page 49).

KENDRICK & Davis, Lebanon, N. H.

K. W. Igniter Co., Section B, Whitney Bldg., Cleveland, O. (see page 181).

KENT Mfg. Works, Atwater, 50 N. Sixth St., Philadelphia, Pa. (see page 185).

KNOBLOCK-Heideman Mfg. Co., South Bend, Ind.

LAVALETTE & Co., 16 E. 42d St., N. Y. City.

MOTSINGER Device Mfg. Co., Pendleton, Ind.

MULLER Porous Plate Accumulator Co., 205 W. 41st St., N. Y. City.

NEVER-Miss Spark Plug Co., Lansing, Mich.

PERFECTION Magneto Co., Anderson, Ind.

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 41).

POLY-Phase Ignition System Co., 52 Broadway, N. Y. City.

REMY Electric Co., Anderson, Ind.

THURSTON Mfg. Co. (The), 356 E. 57th St., Chicago, Ill.

TRITT Electric Co., Union City, Ind.

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INDICATORS (Speed and Distance)

ACME Auto Meter Co., 440 Water St., New York.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

ARTIZAN Brass Co., 204 Lincoln Park Bldg., Chicago, Ill.

AUTO Improvement Co., 316 Hudson St., New York City.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BELL Odometer Works, Oakmont, Pa.

BROOKS Odometer Co., 17 Nicolet St., Lowell, Mass.

BULLARD, J. H., 777 State St., Springfield, Mass.

CHICAGO Pneumatic Tool Co., Fisher Bldg., Chicago, Ill.

DAVIS, S. H. & Co., 68-70 Portland St., Boston, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

HICKS Speed Indicator Co., 1384 Bedford Ave., Brooklyn, N. Y.

HOFFECKER Speed & Mile Register Co., Park Square Motor Mart, Boston, Mass.

JONES, J. W., 127 W. 32d St., N. Y. City.

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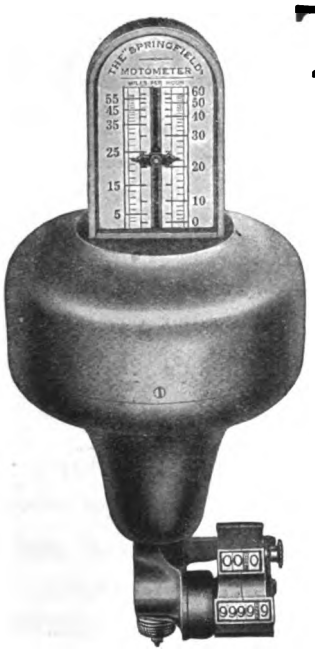

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MOTOR Car Specialty Co., Fidelity Mutual Bldg., Philadelphia, Pa.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

OLIVER Instrument Co., Cor. Hennepin and 7th Sts., Minneapolis, Minn. (see page 89).

POPE Mfg. Co., Hartford, Conn (Jobbers) (see page opposite).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

SMITH Mfg. Co., R. H., Springfield, Mass. (see page 89).

VEEDER Mfg. Co., Hartford, Conn.

WARNER Instrument Co., 403 Roosevelt Ave., Beloit, Wis.

WEBB Mfg. Co., 60 Shipman St., Newark, N. J.

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CARNEGIE Steel Co., Pittsburg, Pa.

CRUCIBLE Steel Co. of Am., Pittsburg, Pa.

DIAMOND State Steel Co., Wilmington, Del.

LOCKHART Iron & Steel Co., McKees Rocks, Pa.

LOGAN Iron & Steel Co., Burnham, Pa.

NATIONAL Steel Co., Pittsburg, Pa.

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MARYLAND Sheet & Steel Co., Cumberland, Md.

TAYLOR Co., N. & G., 308 Chestnut St., Philadelphia, Pa.

WAITE, Ranlet & Co., 80-82 Broad St., Boston, Mass.

WAUKESHA Sheet Steel Co., Waukesha, Wis.

YOUNGSTOWN Iron, Sheet & Tube Co., Youngstown, O.

JACKS

ANDERSON Pole & Shaft Co., Anderson, Ind.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOBED Co. (The), Boston Mass. (Automatic Lift).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers(see page 23).

AUTO Supply Co., Binghamton, N. Y.

BARTH Mfg. Co., Milwaukee, Wis.

BATAVIA Clamp Co., Batavia, N. Y.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

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BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BUCKEYE Jack Mfg. Co., Louisville, O.

COOK'S Railway Appliance Co., Kalamazoo, Mich.

COVERT Mfg. Co., West Troy, N. Y.

DUFF Mfg. Co., Pittsburg, Pa.

EUREKA Mower Co., Utica, N. Y.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FERODOWILL Mfg. Co., St. Paul, Minn.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

GARLICK Auto. Prop Co., Madison Ave. and Broadway, Paterson, N. J.

GLOBE Jack Co., Philadelphia, Pa.

JERSEY Brake Co., 93 Green St., Newark, N. J.

LOCKHART, W. J., 28 Beach St., Boston, Mass.

MAXWELL, L. R., & Co., Cedar Rapids, Ia.

MIAMI Pattern Works, Dayton, O.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

OLIVER Mfg. Co., 213 So. Desplaines St., Chicago, Ill.

PATTERSON, Gottfried & Hunter, Ltd., 146-150 Centre St., N. Y. City.

PEARSALL Mfg. Co., 345-347 W. Fayette St., Syracuse, N. Y.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

ROTH Jack and Tool Co., 68 William St., N. Y. City.

SHAW Engineering & Mfg. Co., Newark, N. J.

SHAWVER Co., Springfield, O.

SMITH & Heminway, 296 Broadway, N. Y. City.

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UNIVERSAL Jack & Power Co., Flatiron Bldg., N. Y. City.

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BOSTON Gear Works, Norfolk Downs, Mass.

CALDWELL-Wilcox Co., Newbury, N. Y.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page opposite).

COATES Clipper Mfg. Co., Worcester, Mass. (see page 45).

GRAY & Prior Machine Co. (The), Hartford, Conn.

HARTFORD Auto Parts Co., Hartford, Conn.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

LAIB Co., Louisville, Ky.

LEHMAN, I., 61 Middle St., Cleveland, O.

MORAN Flexible Joint Co., 149 3d St., Louisville, Ky.

MUNCIE Auto Parts Co., Muncie, Ind.

MUTUAL Machine Co., 25 Wells St., Hartford, Conn.

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VANDERBEEK Tool Wks., Hartford, Conn.

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DOUGLAS & Lomason Co., Detroit, Mich.

HAM Mfg. Co., C. T., Rochester, N. Y.

KELLY Handle Bar Co., Cleveland, O.

KONINGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (see page 21).

MURDOCK, Jr., Co., James, 116 Opera Place, Cincinnati, O.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

STANDARD Welding Co., Cleveland, O.

LAMP BRACKETS (Adjustable)

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page opposite).

IMPERIAL Brass Mfg. Co., 251 So. Jefferson Ave., Chicago, Ill.

NORTHWAY, Thomas J., 102 Exchange St., Rochester, N. Y. (see page opposite).

RANDS, Wm. C., 51 Macomb St., Detroit, Mich.

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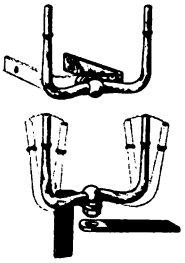

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LONDON Auto Supply Co., 1235 Michigan Ave., Chicago, Ill. (see page 153).

MYERS Auto Top Co., Dayton, O. (see page 153).

NATHAN Novelty Mfg. Co., N. Y. City.

O'NEILL-Ollier Co., 1532-34 Michigan Ave., Chicago, Ill.

VEHICLE Apron and Hood Co., Columbus, O.

WARNER Pole and Top Co., 1655 Central Ave., Cincinnati, O.

WILEY & Son Co., Wm. H., Box 30, Hartford, Conn (see page 149).

LAMPS

ADAMS & Westlake Co. (The), 110 Ontario St., Chicago, Ill.

AMERICAN Auto Brass Co., 181 W. Maple St., Columbus, O.

AMERICAN Lamp Co., 255 Jefferson Ave., Detroit, Mich.

AMERICAN Lamp Wks., 62 West 43d St., N. Y. City.

APFEL-Murdoch & Co., 82 Lake St., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

ATWOOD Mfg. Co., Amesbury, Mass.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BADGER Brass Mfg. Co., Kenosha, Wis.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BROWN Mfg. Co., Columbus, O.

CHICAGO Auto Lamp Works, 71 W. Jackson Blvd., Chicago, Ill.

COLT Co., J. B., 21 Barclay St., N. Y. City.

CORCORAN Lamp Co. (The), 1712 Reading Rd., Cincinnati, O. (see page 19).

COWLES, C. &. Co., New Haven, Conn.

DAYTON Mfg. Co., 2240 E. 3d St., Dayton, Ohio.

DIETZ, R. E. Co., 33 Laight St., N. Y. City.

DU BOIS Searchlight Co., 220 Broadway, N. Y. City.

EDMUNDS & Jones, 315 Riopelle St., Detroit, Mich.

ENGLISH & Mersick Lamp & Fdry. Co., New Haven, Conn.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

FUNKE, A. H., 83 Chambers St., N. Y. City.

GRAY & Davis, Amesbury, Mass.

GRAY, Peter & Sons,, 88-90 Union St., Boston, Mass.

HAM Mfg. Co., C. T., Rochester, N. Y.

HINE-Watt Mfg. Co., 60 Wabash Ave., Chicago, Ill. (see page opposite).

LOCKWOOD, C. N. & Co., 57 Mechanic St., Newark, N. J.

MANHATTAN Brass Co., 328 E. 28th St., N. Y. City.

MANHATTAN Lamp Works, 530 W. 28th St., N. Y. City (see page opposite).

MANHATTAN Screw & Lamp Co., 7th Ave. and 11th St., N. Y. City.

MILLER Mfg. Co., Peekskill, N. Y.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NATIONAL Cement & Rubber Mfg. Co., 3053-59 Monroe St., Toledo, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

NEWARK Coach Lamp Co., 84-96 Monroe St., Newark, N. J.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

PYLE Mfg. Co., 2211 Park Ave., Indianapolis, Ind.

ROSE Mfg. Co., 910 Arch St., Phila., Pa.

RUSHMORE Dynamo Wks., Plainfield, N. J.

SCOVILLE & Peck Co. (The), New Haven, Conn.

STANDARD Lamp Mfg. Co., 43 So. Canal St., Chicago, Ill., and Charlotte, Mich.

STEVENS & Sackett Co. (The), 129-131 Union St., New Haven, Conn.

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VESTA Accumulator Co., 1334 Michigan Ave., Chicago, Ill.

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

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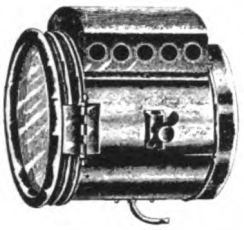

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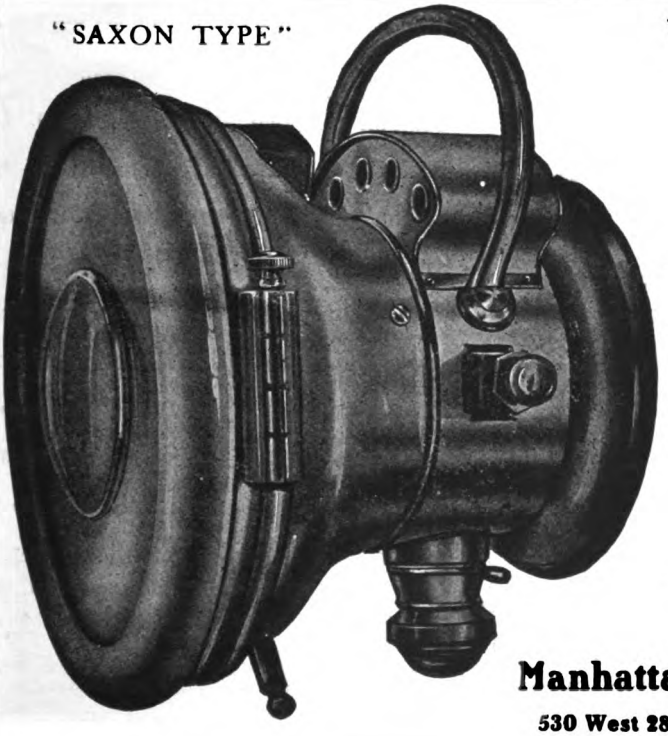

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ASHTABULA Hide & Leather Co., Astabula, Ohio.

CARR, F. S., 74 Pearl St., Boston, Mass. (see page 159).

CHASE Co., L. C., Boston, Mass. (see page 159).

CLEVELAND Tanning Co. (The), Jennings and Dennison Ave., S. W., Cleveland, O.

CRANDAL, Stone & Co., Binghamton, N. Y.

DIAMOND Leather Co., Peabody, Mass.

DUSENBURY, Louis, 86-88 Worth St., New York, N. Y.

HALSEY & Smith, J. H., Shipman and Springfield Ave., Newark, N. J.

HOWELL & Co., T. P., Newark, N. J.

LACKAWANNA Leather Co. (The), Hackettstown, N. J.

PATENT Leather Co. of America (The), Newark, N. J. (see page 159).

RASER Tanning Co., Ashtabula, O.

REILLY & Son Co., P., Newark, N. J.

REX Imperial Leather Co., 16 Chappel St., Newark, N. J.

ROEHM & Davison, Detroit, Mich.

STANDARD Leather Co., Allegheny, Pa.

WARD & Co., E. S., Newark, N. J.

WOLVERINE Leather Goods Co., 59 E. Fort St., Detroit, Mich.

LEATHER (Artificial)

BOSTON Artificial Leather Co., 12 E. 18th St., N. Y. City.

PANTASOTE Co. (The), 11 B'way, N. Y. City (see page 157).

LEGGINGS (See Clothing)

LEVERS (Transmission)

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 189).

GARFORD Co. (The), Elyria, O.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 127).

LICENSE NUMBERS (See Name Plates)

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ART Metal Construction Co., Jamestown, N. Y.

DARBY & Sons Co., Edward, 233 Arch St., Philadelphia, Pa.

MERRITT Co., 1045 Ridge Ave., Phila., Pa.

OHNSTRAND Metal Furniture Co., Jamestown, N. Y.

LUBRICANTS (See Oils and Greases)

LUBRICATORS

AMERICAN Injector Co., Detroit, Mich.

AMERICAN Lubricator Co., Detroit, Mich.

BAY State Stamping Co., Worcester, Mass.

BOWEN Mfg. Co., Auburn, N. Y.

CHARTER Mfg. Co., 303 Dearborn St., Chicago, Ill.

DETROIT Lubricator Co., Lincoln Ave. & G. T. R. R., Detroit, Mich.

DODGE Lubricator Co., 8 Waltham St., Boston, Mass.

ESSEX, G. B., Brass Co., 480 Franklin St., Detroit, Mich.

FRASSE Co. (The), 38 Cortlandt St., N. Y. City.

GREENE, Tweed & Co., 17 Murray St., N. Y. City.

HANCOCK Inspirator Co. (The), 85 Liberty St., N. Y. City.

HANCOCK Mfg. Co., 140 E. Erie St., Chicago, Ill. (see opposite page).

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

IMPERIAL Brass Mfg. Co. (The), 245-247 So. Jefferson St., Chicago, Ill.

KINSEY Mfg. Co., Dayton, O. (see page 83).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

LAVIGNE Mfg. Co., 132 E. Larned St., Detroit, Mich.

LEE Injector Co. (The), Port Huron, Mich.

LUNKENHEIMER Co. (The), Cincinnati, O.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 31).

MANZEL Bros. Co., 313 Babcock St., Buffalo, N. Y. (see page opposite).

M'RAE & Roberts Co., Detroit, Mich.

MADISON-Kipp Mfg. Co., Madison, Wis.

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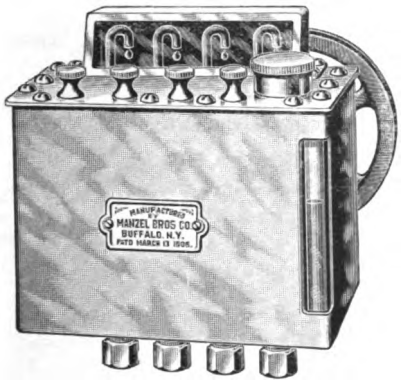
The MANZEL
Force and Sight Feed Lubricator
for Automobiles



Guaranteed to give positive lubrication and to feed regularly.

Constant Sight Feed.

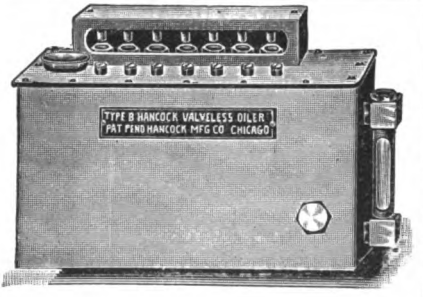
Made with any number of feeds —each feed being regulated independently.

Pulley or ratchet drive as desired.

Send for catalogue. ¶ Pumps on approval to manufacturers.

313 Babcock St. **Manzel Bros. Co.** BUFFALO, N. Y.

OFFICE OF
HANCOCK MFG. CO.
140 E. Erie Street
CHICAGO



October 1, 1906.

Mr. Manufacturer:
My Dear Sir:
I will send you my oiler for trial--Free. Put it on your car and if you like it we will talk business. If you don't like it return it at our expense. That's fair.
Yours truly,

H. W. Hancock,
PRES.

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MANZEL, Chas. W., 93 Main St., Buffalo, N. Y.

MICHIGAN Lubricator Co., 661 Beaubien St., Detroit, Mich.

NATHAN Mfg. Co., 86 Liberty St., N. Y. City.

NATIONAL Sewing Machine Co., Belvidere, Ill.

NEELY, Edw., 244 Wells St., Chicago, Ill.

NOERA Mfg. Co., Waterbury, Conn.

PEDERSEN Mfg. Co., 644 First Ave., New York, N. Y.

PENBERTHY Ejector Co., Detroit, Mich.

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

SIGHT Feed Oil Pump Co., 1148 Holton St., Milwaukee, Wis.

STAR Brass Mfg. Co., 108 E. Dedham St., Boston, Mass.

STEEL Ball Co., 832-840 Austin Ave., Chicago, Ill.

WILLIAM Powell Co. (The), 2525 Spring Grove Ave., Cincinnati, O.

WINKLEY Co. (The), Detroit, Mich.

MACHINERY (Special Automobile)

BAKER Bros., Westlake and Post Sts. and M. C. R. R., Toledo, O.

BARNES, W. F. & John, Co., Rockford, Ill.

BEAMAN & Smith Co. (The), Providence, R. I.

BECKER Brainard Milling Machine Co., Hyde Park, Mass.

BLAKE & Johnson, Waterbury, Conn.

BROWN & Sharpe Mfg. Co., Providence, R. I.

BULLARD Mach. Co., Bridgeport, Conn.

CINCINNATI Electric Tool Co., 650-652 Evans St., Cincinnati, O.

CINCINNATI Milling Machine Co., Cincinnati, Ohio.

COLBURN Machine Tool Co., Franklin, Pa.

DEFIANCE Machine Works, Defiance, O.

FELLOWS Gear Shaper Co. (The), Springfield, Vt.

FIELD Co., Chas. H., 230 Chestnut St., Providence, R. I.

FITCHBURG Machine Works, Fitchburg, Mass.

FRANKLIN Portable Crane and Hoist Co., Franklin, Pa.

GARDAM & Son, Wm., 45-47 Rose St., New York.

GARVIN Machine Co., Spring & Varick Sts., New York.

GEOMETRIC Tool Co., Blake and Valley Sts., New Haven, Conn.

GISHOLT Machine Co., Madison, Wis.

HARTFORD Machine Screw Co., Hartford, Conn.

HEALD Mach. Co. (The), Worcester, Mass.

HILL, Clarke & Co., 156 Oliver St., Boston, Mass.

HISEY-Wolf Machine Co., Cincinnati, O.

KEMPSMITH Mfg. Co. (The), Milwaukee Wis.

LANDIS Tool Co., Waynesboro, Pa.

LAPOINTE Machine Tool Co., Boston, Mass.

NATIONAL-Acme Mfg. Co., Cleveland, O.

NILES-Bement-Pond Co., 111 Broadway, New York.

NORTON Grinding Co., Worcester, Mass.

NOVELTY Tufting Machine Co., 264 Michigan Ave., Chicago, Ill.

POTTER & Johnson Machine Co., Pawtucket, R. I.

PRATT & Whitney Co. (The), Hartford, Conn.

PRENTISS Tool & Supply Co., 115 Liberty St., N. Y. City.

REED Co., Francis, 43 Hammond St., Worcester, Mass.

SMITH Co., William J., 424 State St., New Haven, Conn.

SPRINGFIELD Mach. Tool Co., Springfield, Ohio.

STANDARD Tool Co., Cleveland, O.

STEPTOE Shaper Co. (The), Jno., Cincinnati, O.

VON WYCK Machine Tool Co., Cincinnati, Ohio.

WHITNEY Mfg. Co., Hartford, Conn.

WHITON, D. E. Machine Co., New London, Conn.

WILMARTH & Marmon Co., Grand Rapids, Mich.

MACHINE WORK (To Order)

AMERICAN Machine Mfg. Co., Cleveland, O.

AMERICAN Die & Tool Co., Reading, Pa.

BEVERLY Mfg. Co., Beverly, Mass.

BLAKE & Johnson, Waterbury, Conn.

BULTMAN & Co., F. H., 131 Viaduct, Cleveland, O.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 93).

DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapalis, Ind. (see page 57).

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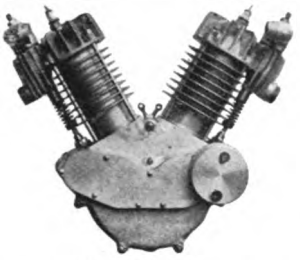

2 Cylinder.
5 H.P. Weight, 65 lbs.

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The Kirkham Motor Mfg. Company

BATH, NEW YORK.

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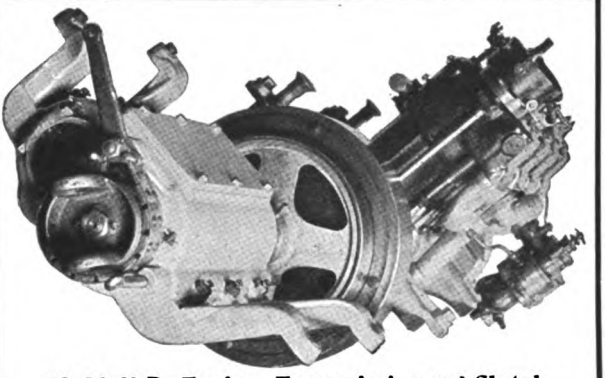
KIRKHAM MOTORS, TRANSMISSIONS, CLUTCHES, ETC.,

if you are looking for high-grade power equipment.



18-22 H.P. Engine, Transmission and Clutch. Weight, 340 lbs.

Manufacturing to Order.

We make automobile parts to order, from your drawings, the way you want them—sometimes better than you want them. We're the automobile builder's auxiliary plant—his annex. We produce parts that are commonly neglected—parts no one else wants to make—and we make them well. Our plant is large, on a high economical basis, and we save the part-maker's profit—particularly on Brakes, Brake-Bands, Brake-Drums, Ball-Races, Connecting-Rods, Gaskets, Hub-Caps, Hub-Flanges, Tank-Heads, Sectors, Special Machine Work and Stampings in general. Our imperfections are made right for the cost of a two-cent stamp. We're specialists on delivering the day promised.

THE GLOBE MACHINE & STAMPING CO.
Hamilton Avenue, Cleveland

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FERRO Machine & Foundry Co. (The), 115 Wade Bldg., Cleveland, O. (see page 175).

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 99).

HATCHER Auto Parts Co. (The), 140 Viaduct, Cleveland, O. (see page 5).

JONES, Frank S., 629 Filbert St., Phila., Pa.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

LEE Mfg. Co. (The), Port Huron, Mich.

LONG Arm System Co., Lakeside Ave. and 38th St., N. E., Cleveland, O.

LOUGH-Scott Co. (The), 26 Cortlandt St., N. Y. City.

MACHINERY Forging Co., Cleveland, O.

MASSNICK Mfg. Co., 1567 River St., Detroit, Mich.

McCUTCHEON Gear & Mfg. Co., 205 West South St., Indianapolis, Ind.

PATTINSON Mfg. Co., 48 Stanhope St., Boston, Mass.

PITTSBURG Brass Mfg. Co., Pittsburg, Pa.

PURITAN Machine Co., Detroit, Mich.

RHODE Island Machine Co. (The), Providence, R. I.

TAFT-Pierce Co., Woonsocket, R. I.

THROOP Perforating Co., 80 Terrace, Buffalo, N. Y.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page opposite).

MACHINES, DRILLING (Flexible)

COATES Clipper Mfg. Co., Worcester, Mass. (see page 45).

MACHINES, TUFTING, (Upholstering)

NOVELTY Tufting Machine Co., 264 Michigan Ave., Chicago, Ill.

MAGNETOS (See Igniting Devices)

MAPS (Road)

MENDENHALL, C. S., Race St. and Opera Pl., Cincinnati, O.

OFFICIAL Automobile Blue Book, Flatiron Bldg., N. Y. City (see page 25).

SURVEY Map Co., 428 Lafayette St., N. Y. City.

MARKERS (See Name Plates)

MATS (Rubber)

BOSTON Woven Hose Co., Cambridge, Mass.

DIAMOND Rubber Co., Akron, O.

EMPIRE Rubber Co., Trenton, N. J.

GOODRICH, B. F., Co., Akron, O.

GOSHEN Rubber Works, Goshen, Ind.

HARTFORD Rubber Works Co., Hartford, Conn. (see pages 161 and 162).

MANHATTAN Rubber Co., 18 Vesey St., N. Y. City.

MONARCH Rubber Co., 41 N. 7th St., Philadelphia, Pa.

NEW JERSEY Car Spring & Rubber Co., Wayne and Brunswick Sts., Jersey City, N. J.

PEERLESS Rubber Mfg. Co., 16 Warren St., N. Y. City.

VICTOR Rubber Co. (The), Springfield, O.

METALS (Babbitt)

ADVANCE Mfg. Co., Todd Bldg., Kalamazoo, Mich.

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page 51).

CLUM & Atkinson, Rochester, N. Y.

COLUMBIA Smelting & Refining Co., 307 Water St., N. Y. City.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

MAGNOLIA Metal Co., 113-115 Bank St., N. Y. City.

NEW Era Mfg. Co. (The), Kalamazoo, Mich.

PHOSPHOR-Bronze Smelting Co. (The), Ltd., 2200 Washington Ave., Phila., Pa.

REEVES, Paul S. & Son, 1415 Catherine St., Philadelphia, Pa.

SHONBERG, I., 363 Hudson Ave., Brooklyn, N. Y.

SYRACUSE Aluminum & Bronze Co., Syracuse, N. Y. (see page 53).

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

METALS (Brass and Copper)

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page 51).

ANSONIA Brass & Copper Co., Ansonia, Conn.

BOKER & Co., Herman, 101 Duane St., N. Y. City.

BRIDGEPORT Brass Co., Bridgeport, Conn.

CHICAGO Brass Co., Kenosha, Wis.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

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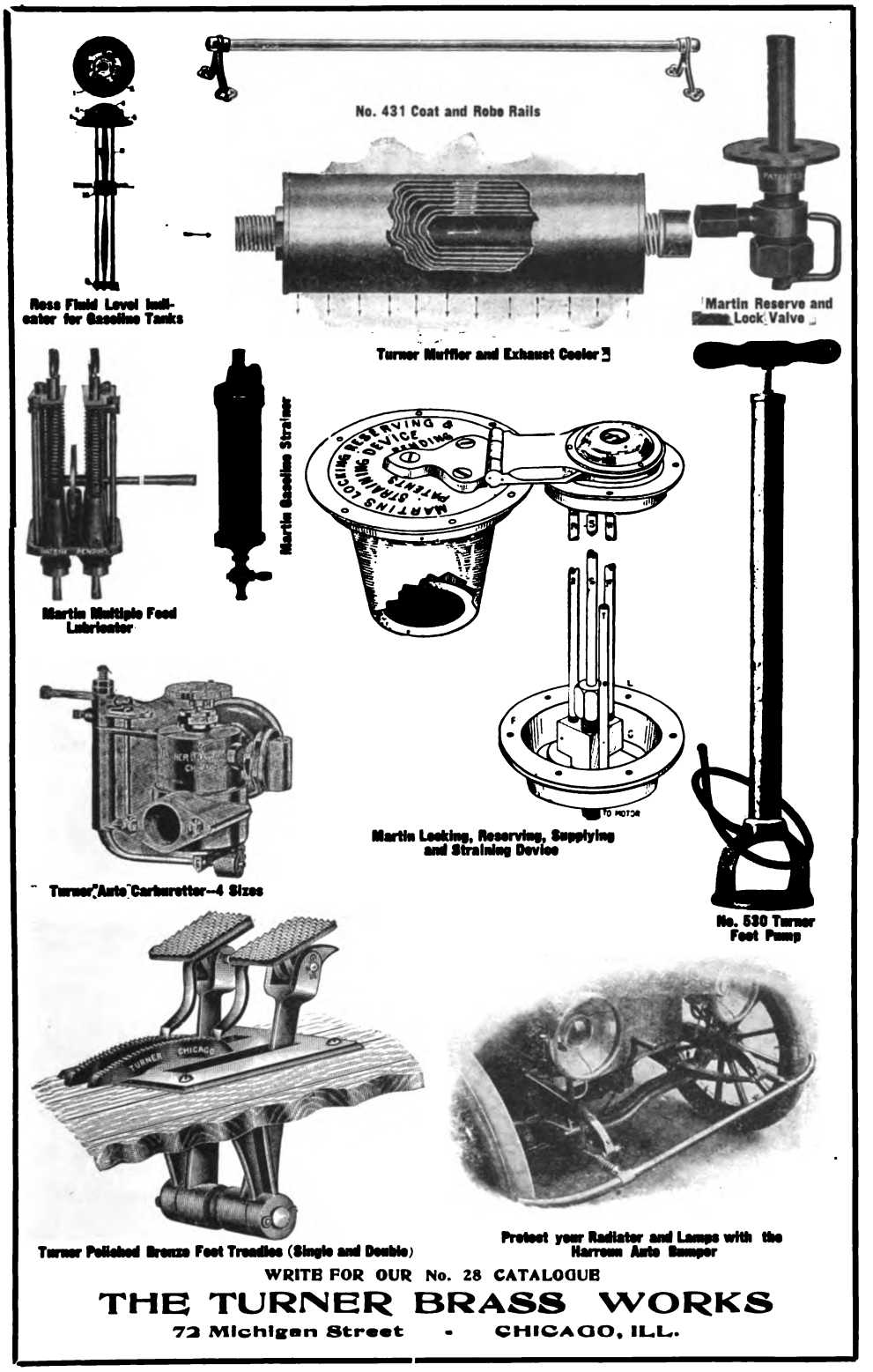

WRITE FOR OUR No. 28 CATALOGUE

THE TURNER BRASS WORKS

72 Michigan Street - CHICAGO, ILL.

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DETROIT Copper & Brass Rolling Mills, Detroit, Mich.

EATON, Cole & Burnham, 253 Broadway, N. Y. City.

ELECTRIC Smelting & Aluminum Co. (The), Lockport, N. Y.

HOLMES, Booth & Hayden Co. (The), Waterbury, Conn.

NEW HAVEN Copper Co., New Haven, Conn.

RANDOLPH-Clowes Co., Waterbury, Conn.

METAL (Perforated)

AITCHISON Perforating Co., 303 Dearborn St., Chicago, Ill.

HARRINGTON & King Perforating Co., 236 N. Union St., Chicago, Ill.

MICA (Insulation)

AMERICAN Mica Co., Newton Lower Falls, Mass.

ASHEVILLE Mica Co., Asheville, N. C.

CAROLINA Locust Pin & Mica Co., Franklin, N. C.

CHICAGO Mica Co., Valparaiso, Ind.

MICA Insulator Co., New York and Chicago.

MICA Manufacturing Co., New York, N. Y.

MUNSELL, Eugene & Co., 218 Water St., N. Y. City.

NORTH Carolina Mica Co., Boston, Mass.

SCHOONMAKER, A. O., 221 Fulton St., N. Y. City.

SILLS-Eddy Mica Co., Newark, N. J.

VANCE, D. T., Plumtree, N. C.

MODEL MAKERS (See Pattern Makers)

MONOGRAMS

ABBOTT, W. H., 1263 Broadway, N. Y. City.

CHILDS & Co., S. D., 200 S. Clark St., Chicago, Ill.

COLGAN Co. (The), J. W., Sudbury Bldg., Boston, Mass.

FIELD, Frank C., 605 N. St. Clair St., Toledo, O.

FINE, Horace E., Trenton, N. J.

MONOGRAM & Crest Engraving Co., 125 E. 86th St., N. Y. City.

SALMAN & Co., John A., 17 Bromfield St., Boston, Mass.

STAFFORD Co., N., 67 Fulton St., N. Y. City.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

MOTORS (Electric)

BROWNING Mfg. Co., Milwaukee, Wis.

BULLOCK Electric Co., Cincinnati, O.

C. & C. Electric Co., 143 Liberty St., N. Y. City.

CHAPMAN, W. H., Portland, Me.

EDDY Electric Mfg. Co. (The), Windsor, Conn.

ELECTRIC Vehicle Equipment Co., 20th & Montgomery Ave., Philadelphia, Pa.

ELWELL-Parker Electric Co., 1076 Hamilton St., Cleveland, O.

FT. WAYNE Electric Works, Ft. Wayne, Ind.

GENERAL Electric Co., Schenectady, N. Y.

GILMORE Electric Co., 625 First St., Boston, Mass.

HERTNER Electric Co., Cleveland, O.

KENDRICK & Davis, Lebanon, N. H.

LAMB & Co., Kent & Lyons Sts., Grand Rapids, Mich.

LAMB Electric Co., 31 Canal St., Grand Rapids, Mich.

LINCOLN Electric Co., World Bldg., Cleveland, O.

MERRIAM-Abbot Co., 60 E. Prospect St., Cleveland, O.

MILWAUKEE Electric Co., Milwaukee, Wis.

PARSELL & Weed, 129-131 W. 31st St., N. Y. City.

RICHARDSON Engineering Co., Hartford, Conn. (see page 135).

ROTH Bros. & Co., 27-29 S. Clinton St., Chicago, Ill.

SPRAGUE Electric Co., 527 W. 34th St., N. Y. City.

STERLING Electric Motor Co., Dayton, O.

STOREY Motor & Electric Co., 321 Sussex St., Harrison N. J.

WAGNER Electrical Mfg. Co., St. Louis, Mo.

WESTINGHOUSE Elec. & Mach. Co., Pittsburg, Pa.

MOTORS (Gasoline Auto)

ALLEN & Kilducheosky, 220 W. 10th St., N. Y. City.

AMERICAN Die & Tool Co., Reading, Pa.

B. L. M. Motor Car Co., 1 Delevan St., Brooklyn, N. Y.

BADECKER Gas Engine Co., Omaha, Neb.

BARNARD-Briggs Mfg. Co., 27 State St., Boston, Mass.

BEAVER Mfg. Co., Barclay & Oregon Sts., Milwaukee, Wis. (see page 61).

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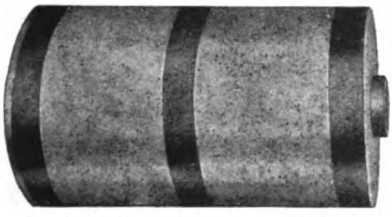
IN ADVANCE

OF THE TIMES

are **"AUTO-POWER"** parts. They **eliminate** the sources of **trouble** common in Automobiles—are **scientifically designed** and **constructed** of the **best materials.** They **reduce** the **cost** of installation and **minimize** maintenance.

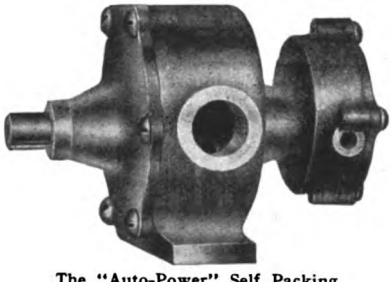


The "Auto-Power" Muffler, an absolute silencer of the exhaust. No Back Pressure.

The "Auto-Power" Timer and Distributer Intensifies Spark and Operates Multiple Cylinder Engines with a Single Coil.

Satisfied users have proven the claims made for "AUTO-POWER" parts.

The "Auto-Power" Single Pump Never Leaks. Durable Construction.



The "Auto-Power" Self Packing Combined Oil and Water Pump.

NOTICE: We solicit the opportunity of sending any of our parts on 30 days' trial to reliable manufacturers.

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Offices: The Arcade Bldg. Cleveland, Ohio

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BEILFUSS Motor Co. (The), E. Saginaw St., Lansing, Mich.

BEVERLY Mfg. Co., Beverly, Mass.

BOWEN Motor Co., 92 Baynes St., Buffalo, N. Y.

BRENNAN Motor Co., Syracuse, N. Y.

BROWNELL-Trebert Co., 408 St. Paul St., Rochester, N. Y.

BUFFALO Engine Co., 12-20 Perry St., Buffalo, N. Y.

BURTT Mfg. Co., 128 No. Edward St., Kalamazoo, Mich.

CARLSON, Chas. A., 1060 Bedford Ave., Brooklyn, N. Y.

CLEMICK-Hirsch Co., 594 National Ave., Milwaukee, Wis.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich.

CROUCH Chas. P. & Co., 484 Carroll Ave., Chicago, Ill.

CUSHMAN Motor Co., Lincoln, Neb.

DAVIS Mfg. Co., 935 30th St., Milwaukee, Wis.

DOMINICK & Co., Wm., 542 Wabash Ave., Chicago, Ill.

DURYEA Power Co., Reading, Pa.

FAIRBANKS-Grant Mfg. Co., Ithaca, N. Y.

FAIRFIELD Motor Co. (The), 172 Cannon St., Bridgeport, Conn.

FAIRMOUNT Engineering Wks., Philadelphia, Pa.

FEDERAL Auto Co., 1334 First National Bank Bldg., Chicago, Ill.

FOWLER Machine Co. (The), Lowell, Mass.

FOX Reversible Engine Co., Covington, Ky.

GOSHEN Motor Works, Goshen, Ind.

GRANT-Ferris Co., Troy, N. Y.

HARVARD Marine & Auto Co., 25 Eliot St., Cambridge, Mass.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

HAYDEN Co., N. L., Columbus, O.

HOMAN, J. & E., 380 West Broadway, N. Y. City.

HUBBARD Motor Co., Middletown, Conn.

ILLINOIS Auto & Parts Co., Globe & Main Sts., Peoria, Ill.

KIRKHAM Motor Mfg. Co., Bath, N. Y. (see page 99).

LAUTH & CO., J., 528 Elston Ave., Chicago, Ill.

M'FARLAND Foundry & Machine Works, Trenton, N. J.

MAXWELL & Fitch Co., 218 So. Washington, St., Rome, N. Y.

MERKEL Motor Co., 1095 26th Ave., Milwaukee, Wis.

MILWAUKEE Auto Engine and Supply Co., 706-708 Winnebago St., Milwaukee, Wis.

MILWAUKEE Motor Co., 615 Clybourn Ave., Milwaukee, Wis.

MODEL Gas Engine Works, Peru, Ind.

MURILLO Motor Car Co., 5th & Nebraska Sts., Marion, Ind.

MURRAY, W. B., 1253 Milwaukee Ave., Chicago, Ill.

NEER Auto Engine Co. (The), 25 W. Russell St., Columbus, O.

NORTH Chicago, Mach. Co. (The), North Chicago Ill.

O. K. Gas Engine Works, Winchester, O.

OTTO Gas Engine Works (The), 33d & Walnut Sts., Philadelphia, Pa.

PHILLIPS Motor Works, 405 Tacoma Bldg., Chicago, Ill.

PIERCE Engine Co., Racine Junction, Wis.

PITTSBURG Machine Co. (The), New Brighton, Pa.

REEVES Pulley Co., Columbus, Ind.

ROCHESTER Die Shaper Co., Rochester, N. Y.

ROSS & Kramer, 5607 So. Halsted St., Chicago, Ill.

SINTZ, Guy L., Fulton and Front Sts., Grand Rapids, Mich.

SMITH & Williams, 149 W. State St., Columbus, O.

SPEED Changing Pulley Co., Indianapolis, Ind. (see page 47).

STERLING Engine Co., 110 Grant St., Buffalo, N. Y.

STREIT Machine Co., A., 1108-10 Harrison Ave., Cincinnati, O.

STROBEN, John, 1416 W. Locust St., Davenport, Ia.

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

SWAIN Engine Co., 140 West Lake St., Chicago, Ill.

TORBENSEN Motor Car Co., Bloomfield, N. J.

TREBERT Gas Engine Co., 163 West Main St., Rochester, N. Y.

TRIUMPH Motor Car Co., Cragin Station, Chicago, Ill.

VAN AUKEN-Clevauce Co., Yonkers, N. Y.

WAUKESHA Motor Co., Waukesha, Wis.

WESTERFIELD Motor Co. (The), Anderson, Ind.

WESTERN Motor Co., Logansport, Ind.

WRIGHT Motor Co., 48 S. Division St., Buffalo, N. Y.

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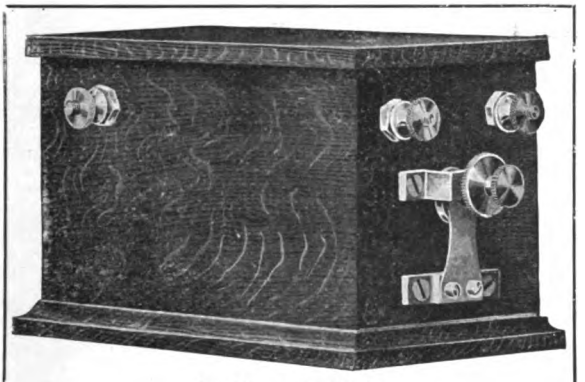
1907 Line

Schug Induction Spark Coil
Schug Accessories
Schug Toledo Storage Battery

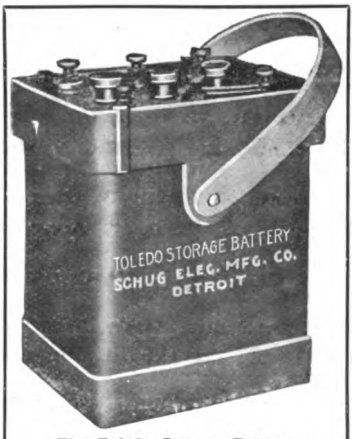


Our New 1907 Model
Schug Coil, Extra High Speed

Schug Induction Spark Coils are primarily dependable, built to get all the power and speed possible out of your engine, whether motor boat or automobile.

The Toledo Storage Battery is marketed expressly for motor vehicle and motor boat use—adapted for daily service and hard usage.

It produces a superior current for ignition work and gives perfect satisfaction and comfort for maintaining electric lights on both car and boat.



The Toledo Storage Battery

Each Schug Accessory is as perfect as the Schug Spark Coil

Spark Coils	**Timers**	**Secondary Wire**	**Storage Batteries**	**Magnetos and**
Mica Spark Plugs	**Primary Wire**	**Switches**	**Ignition Dynamos**	**Portable Battery Lamps**

Our entire line is described and illustrated in the booklet we are waiting to send you.

Schug Electric Co., 326 Jefferson Ave., Detroit, Mich.

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MOTORS (Gasoline, Marine)

AUTOMATIC Machine Co. (The), Bridgeport, Conn.

AYRES Gasoline Eng. & Auto Works, Saginaw, Mich.

BADECKER Gas Engine Co., Omaha, Neb.

BADGER Motor Co., Milwaukee, Wis.

BARBER Bros., 101 Grape St., Syracuse, N. Y.

BRENNAN Motor Co., Syracuse, N. Y.

BRIDGEPORT Motor Co., Inc., Bridgeport, Conn.

BROWN-Cochran Co. (The), Lorain, O.

BROWN-Talbot Co., Salem, Mass.

BROWNELL-Trebert Co., 408 St. Paul St., Rochester, N. Y.

BUFFALO Gasoline Motor Co., 1286 Niagara St., Buffalo, N. Y.

CAILLE Bros. Co. (The), 2d Ave. and Amsterdam St., Detroit, Mich.

CAMDEN Anchor-Rockland Machine Co., Rockland, Me.

CAMPBELL Motor Co., Waygata, Minn.

CARLSON, Chas. A., 1060 Bedford Ave., Brooklyn, N. Y.

CHICAGO Caloric Engine Co., 536 Wabash Ave., Chicago, Ill.

CLEMICK-Hirsch Co., 594 National Ave., Milwaukee, Wis.

CLIFTON Motor Wks., 265 E. Clifton Ave., Cincinnati, O.

COLEMAN & Sons, Walter, 300 S. Water St., Providence, R. I.

COOLEY Mfg. Co., Waterbury, Vt.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich.

CRAIG & Scott, 556 W. 34th St., New York.

CROSS Engine Co., M. O., 18 Atwater St. W., Detroit, Mich.

CROUCH & Co., Chas. P., 484 Carroll Ave., Chicago, Ill.

CUSHMAN Motor Co., Lincoln, Neb.

DAVIS Mfg. Co., 935 30th St., Milwaukee, Wis.

DE MOOY Bros., 765-767 Willson Ave., Cleveland, O.

DETROIT Auto Marine Co., 82 Congress St., E., Detroit, Mich.

DOMAN Co., H. C., Oshkosh, Wis.

DUCRO Mfg. Co., 1378 Niagara St., Buffalo, N. Y.

DULUTH Gas Engine Works, Minnesota Ave., and Vine St., Duluth, Minn.

DUNN, Walter E., Ogdensburg, N. Y.

ERA Motor Co., Saginaw, Mich.

ERICSSON & Moon Mfg. Co. (The), Second St., Detroit, Mich.

ESSEX Engine Co. (The), 416 Union St., Lynn, Mass.

FAIRBANKS-Grant Mfg. Co., Ithaca, N. Y.

FAIRFIELD Motor Co. (The), 172 Cannon St., Bridgeport, Conn.

FAY & Bowen Mfg. Co., Geneva, N. Y.

FOX Reversible Gaso. Engine Co., Inc., Covington, Ky.

GRAND Rapids Gas Engine & Yacht Co., Grand Rapids, Mich.

GRAY Motor Boat Co., 453 Guoin St., Detroit, Mich.

HAASE Motor Wks., 1019 Lloyd St., Milwaukee, Wis.

HARVARD Marine & Auto Co., 25 Eliot St., Cambridge, Mass.

HASBROUCK Motor Works, Inc., 155 Water St., New London, Conn.

HEINEL Co., H. A., Wilmington, Del.

HILDRETH Motor & Pump Co. (The), Waterside Ave., Lansing, Mich.

HILL, R. S., 78 E. Fort St., Detroit, Mich.

HOLLIDAY Mfg. & Engine Co., Chicago, Ill.

HOLMES Motor Co. (The), West Mystic, Conn.

HOWE Scale Co., 509 Market St., Philadelphia, Pa.

HUBBARD Motor Co., Middletown, Conn.

HURD & Haggin, 316 Hudson St., N. Y. City.

JOHNSON Motor Co. (The), Chester, Pa.

KAHLENBERG Bros., Two Rivers, Wis.

KIRKHAM Motor Mfg. Co., Bath, N. Y. (see page 99).

KOWALSKY Engine Co. (The), J., Verona, Pa.

LACKAWANNA Mfg. Co. (The), Newburgh, N. Y.

LAMB Boat & Engine Co., Clinton, Ia.

LOCKWOOD-Ash Motor Co., Jackson, Mich.

MASSINICK Mfg. Co., 671 E. Atwater St., Detroit, Mich.

McNAIL Brainard Engine Co., 390 Webster Ave., Long Island City, N. Y.

MIANUS Motor Works, Mianus, Conn.

MILWAUKEE Motor Co., 615 Clybourn Ave., Milwaukee, Wis

MOTOR Car Power Equipment Co., Rear 577 Grove St., Milwaukee, Wis.

MURRAY & Tregurtha Co., 340 W. First St., So. Boston, Mass.

NEW London Motor Co., New London, Conn.

NORTH Chicago Mach. Co. (The), North Chicago, Ill.

NOYE Mfg. Co., Buffalo, N. Y.

OTTO Gas Engine Works (The), 33d and Walnut Sts., Philadelphia, Pa.

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It works on the principle of the pop valve on a boiler. Simply set this valve for the pressure desired, then the pop valve "blows off" when the desired pressure is reached. Every tire will be equally inflated and not rim-cut because of unequal weight on any one tire. Simple, yet unfailingly accurate. Is guaranteed to stay accurate. Simply impossible for you to pump more air into one tire than another while the valve is set at the same mark. Aside from the Perfect Indicator, the BELL is the finest compound pump sold to-day. It is made of brass throughout, works smoothly and easily, takes up less room than the ordinary pump. It will save you the cost of more than one tire during the season. Price $6.00 each. Manufactured by

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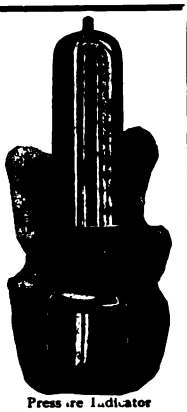

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It is the only practical soot proof plug on the market. Excels in Electrical and Flame Tests; nothing better for assured durability and reliability.

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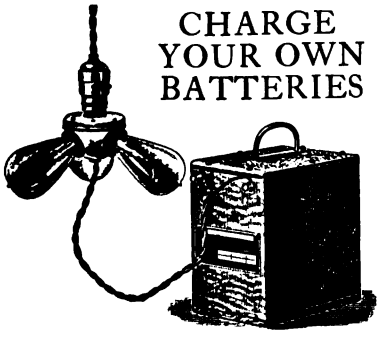

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have proved themselves winners and equal to all tests given them. If you want a coil that never breaks down in the windings and that has the highest possible speed, look into the merits of our goods.

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Lansing, Mich., U. S. A.

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PARKER Co., J. J., 506 Erie St., Buffalo, N. Y.

PENINSULAR Motor Co., Grand Rapids, Mich.

PENNSYLVANIA Iron Works Co., 50th and Lancaster Ave., Philadelphia, Pa.

PHILLIPS Motor Works, 405 Tacoma Bldg., Chicago, Ill.

PIERCE Engine Co., Racine Junction, Wis.

PIGGINS Bros., Racine, Wis.

POTTER Mfg. Co., New Brunswick, N. J.

PROGRESS Mfg. Co. (The), Torrington, Conn.

RATHBURN-Lacy Co., Toledo, O.

REGAL Gasoline Engine Co., Coldwater, Mich.

REX Motor Co., 69 Woodward Ave., Detroit, Mich.

ROCHESTER Gas Engine Co., 705 Driving Park Ave., Rochester, N. Y.

ROYAL Equipment Co., Bridgeport, Conn.

SAINT Clair Motor Co., 131 Beaubien St., Detroit, Mich.

SEITZ Co., F. A., 141 Frelinghuysen Ave., Newark, N. J.

SINTZ, Claude, 280 S. Front St., Grand Rapids, Mich.

SMALLEY Motor Co., Ltd., Bay City, Mich.

SMITH & Williams, 149 W. State St., Columbus, O.

SPARKS Machine Co., C. F., Alton, Ill.

STAMFORD Motor Co. (The), Stamford, Conn.

STANDARD Motor Construction Co. (The), 172 Whiton St., Jersey City, N. J.

STERLING Engine Co., 119-121 Grant St., Buffalo, N. Y.

STRELINGER Co., Chas. A., 96-110 Bates St., Detroit, Mich.

TEMPLE Pump Co. (The), 15th St. and 15th Pl., Chicago, Ill.

TERMAAT & Monahan Co., Oshkosh, Wis.

TOCQUET Motor Co. (The), 4th Ave. and 24th St., N. Y. City.

TREBERT Gas Engine Co., 163 W. Main St., Rochester, N. Y.

TRIUMPH Motor Car Co., Cragin Station, Chicago, Ill.

TUTTLE, H. D., Co., Canastota, N. Y.

UNITED Mfg. Co., 175 Woodbridge St., Detroit, Mich.

VIRTUE & Pond Mfg. Co., Owatanna, Minn.

WATKINS, Frank M., Co. (The), 523 Baymiller St., Cincinnati, O.

WESTERN Gas Engine Co., Michigan City, Ind.

WOLVERINE Motor Wks., Grand Rapids, Mich.

WRIGHT Motor Co., 48 S. Division St., Buffalo, N. Y.

MOTORS (Kerosene)

ACME Oil Engine Co., Union Ave., near R. R., Bridgeport, Conn.

BUFFALO Gasoline Motor Co., Niagara St., Buffalo, N. Y.

DIESEL Motor Co., 11 Broadway, N. Y. City.

FRANTZ Mfg. Co., Cherryville, Pa.

GRAND Rapids Gas Engine & Yacht Co., Grand Rapids, Mich.

INTERNATIONAL Power Vehicle Co., 216 Pacific St., Stamford, Conn.

MIETZ, A., 138 Mott St., N. Y. City.

NEW YORK Kerosene Oil Motor Co. (The), 31 Burling Slip, New York, N. Y.

MOUNTINGS (See Trimmings, Metal)

MUD GUARDS (See Dashes and Fenders)

MUFFLERS (Exhaust)

A. & J. Mfg. Co., 26 W. Randolph St., Chicago, Ill.

A-Z Co. (The), 527 West 56th St., N. Y. City.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 123).

BOWEN Motor Co., 92 Baynes St., Buffalo, N. Y.

BYRNE, Kingston & Co., Kokomo, Ind.

CHAMPION Mfg. Co., 9-15 Alling St., Newark, N. J.

FEDERAL Automobile Co., First Nat'l Bk. Bldg., Chicago, Ill.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 99).

GRAY-Hawley Mfg. Co., 605-609 Fort St. W., Detroit, Mich.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

HAYES Mfg. Co., Detroit, Mich. (see page 119).

HAYNEY, Geo. F., Lynn, Mass.

KELLS Mfg. Co., W. J., Jersey City, N. J. (see page 85).

KINSEY Mfg. Co., Dayton, O. (see page 83).

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EJECTOR MUFFLER

Fig. 1

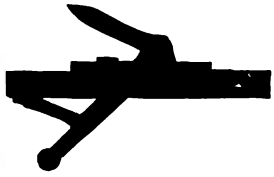


Fig. 2

THE EJECTOR, MUFFLER, CUT-OUT VALVE AND FOOT PEDAL

Fig. 1—Cutout Valve
Fig. 2—Foot Pedal
Fig. 3—The Muffler

A Muffler that Muffles

A muffler that will please you and that you can depend on to please your customers.

Designed and built on exclusive lines, it absolutely silences the explosions without taking power from the Motor but ACTUALLY INCREASING IT.

This may seem an out-of-the-ordinary combination, it is—because it is done by an *out-of-the-ordinary Muffler*, but send your name and address *and we will prove it.*

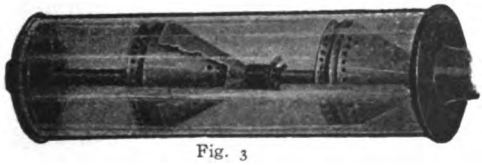
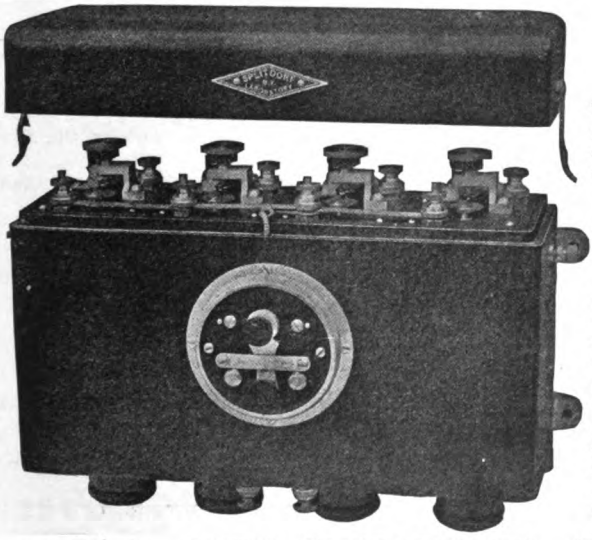


Fig. 3

Special inducements to manufacturers and live dealers to handle our muffler. Write to-day.

MOTOR AND MANUFACTURING WORKS CO., Ithaca, N. Y.

SPLITDORF COILS



Can be depended upon.

That is one of the reasons for their popularity. Most of the races won and records broken were with cars equipped with Splitdorf Coils.

This proves their superiority.

Splitdorf Coils, Commutators, Spark Plugs and Ignition Cables are all carefully constructed. Only the highest grade material enter into their manufacture.

If your customers are having trouble with Ignition Apparatus, sell them "SPLITDORF"—It will overcome all their troubles—please them—and put money in YOUR pocket. Write for particulars.

C. F. SPLITDORF, 17–27 Vandewater Street, NEW YORK.

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KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

LOOMIS Autocar Co., Westfield, Mass.

MAYO Damper Co., 355 Walnut St., Pottstown, Pa.

MILWAUKEE Motor Co., Milwaukee, Wis.

MOTOR & Mfg. Works Co., Ithaca, N. Y. (see page 109).

POWELL Muffler & Timer Co., Utica, N. Y.

ROSS & Kramer, 5607 So. Halsted St., Chicago, Ill.

SMITH & Co., D. B., Utica, N. Y. (see page 179).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WEEBER, C. F., Mfg. Works, 170-172 Central Ave., Albany, N. Y.

WESTERFIELD Motor Co., Anderson, Ind.

WESTERN Motor Co., Logansport, Ind.

MUFFLERS (Neck)

SCOTT Muffler Co. (The), 71 Gallia St., Portsmouth, O.

WAY Muffler Co. (The), 23d and Arch Sts., Philadelphia, Pa.

NAME PLATES

ABBOTT, W. H., 1263 Broadway, N. Y. City.

ALLEN Auto Specialty Co., 1931 Broadway, N. Y. City.

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page 51).

ALUMINUM Mfg. Co., Two Rivers, Wis.

ATWOOD Mfg. Co., Amesbury, Mass.

BALTIMORE Enamel & Novelty Co., Ft. of Allen St., Baltimore, Md.

BECKER, August, 247 Atlantic Ave., Boston, Mass.

BLACKINGTON & Co., V. H., Attleboro Falls, Mass.

BOYLE & Co., John, 112-114 Duane St., N. Y. City.

CHANDLER Co. (The), 31 Taylor St., Springfield, Mass.

CHILDS, S. D., & Co., 200 So. Clark St., Chicago, Ill.

CROWE Metal Mfg. Co., 71 W. Jackson Blvd., Chicago, Ill.

DETROIT Rubber Stamp Co., 99 Griswold St., Detroit, Mich.

EASTWOOD Wire Mfg. Co., Belleville, N. J.

ENGLISH & Mersick Co., New Haven, Conn.

FINE, Horace E., Trenton, N. J.

GREACEN & Co., Walter, 12 Mechanic St., Newark, N. J.

IMPERIAL Brass Mfg. Co., 251 So. Jefferson St., Chicago, Ill.

MEYERCORD Co. (The), Chamber of Commerce, Chicago, Ill.

MORSE, C. H., & Son, 13 So. Water St., Rochester, N. Y.

MURDOCK-Shaw Co., 125 Federal St., Boston, Mass.

MURDOCK, Jas. Jr., Co., 116 Opera Place, Cincinnati, O.

N. J. Aluminum Co., Newark, N. J.

NEW YORK Stencil Works, New York, N. Y.

QUINT, S. H., & Sons, 15 So. 4th St., Philadelphia, Pa.

REES, F. H., Steele Memorial Bldg., Elmira, N. Y.

ROBBINS Mfg. Co., John, 58 Kneeland St., Boston, Mass.

ROGERS, C. E., 34 Beach St., Boston, Mass.

SMITH, R. H., Mfg. Co. (The), Springfield, Mass. (see page 80).

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

SPENCER'S Sons, I. S., Guilford, Conn.

STAFFORD Co., N., 67 Fulton St, New York.

TORREY Roller Bushing Works, Bath, Me.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WADSWORTH Engraving Co., 21 W. Washington St., Springfield, O.

WALTER, N. C., & Sons, 194 William St., N. Y. City.

NIPPLES

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

HARTFORD Machine & Screw Co., 476 Capitol Ave., Hartford, Conn.

JAMESVILLE Mfg. Co., Jamesville, N. Y.

JUDD & Leland Mfg. Co., Clifton Springs, N. Y.

PARK City Brass Co., Springfield, Mass.

PARKER, E. N., Springfield, Mass.

SHRIMPTON Mfg. Co., Church St., N. Y. City.

STANDARD Co. (The), Torrington, Conn.

STEVENS & Co., New York, N. Y.

TILEY-Pratt Co. (The), Essex, Conn.

TOLEDO Metal Wheel Co., Toledo, O.

YOUSE, E. S., Reading, Pa.

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A graded control over the recoiling springs. This control increases in proportion to the effort on the springs. It is least at the initiative and the highest power is exerted at the final action where it is needed. This insures easy riding over smooth roads as well as rough roads.

Made to fit all kinds of cars. No oiling or adjusting necessary.

Price $60.00 per set of Four

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offer the Trade for 1907 an entirely new line of Chains, re-designed on scientific lines, producing the lightest and strongest chains made. Correct in construction. Made from selected stock.

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The McKINNEY REMOVABLE TIRE HOLDER

No bolts or nuts used to remove the same from the fixtures.
Excellent in design, convenient in form. Can hold one or two tires.

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EUREKA Nut Lock Co., Pittsburg, Pa.

MICHIGAN Bolt & Nut Co., Detroit, Mich.

NATIONAL Elastic Nut Co., Milwaukee, Wis.

NATIONAL Lock Washer Co., 65-79 Johnson St., Newark, N. J. (see page 177).

POSITIVE Lock Washer Co., Newark, N. J. (see page 177).

SPIRAL Nut Lock Co., New York, N. Y.

ODOMETERS (See Indicators—Speed and Distance)

OILS

ALEXANDER & Co., H. T., 17 State St., N. Y. City.

AMERICAN Cement & Oil Co., 44 W. Quincy St., Chicago, Ill.

AMERICAN Oil Co., 170-178 S. Water St., Jackson, Mich.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BESLY & Co., C. H., Chicago, Ill.

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BORNE-Scrymser Co., Claremont, N. J.

CHAMPION Oil Co., 39th St. and Lowe Ave., Chicago, Ill.

CHESTERTON & Co., A. W., 64 India St., Boston, Mass.

CHILDS Co., G. B. (The), 499 Greenwich St., N. Y. City.

CLARK, E. W., & Co., 89 New Chambers St., N. Y. City.

COLE, G. W. Co., 141 Broadway, N. Y. City.

COLUMBIA Lubricants Co. of New York, 78 Broad St., N. Y. City (see page opposite).

CURRY Oil & Supply Co., Boston, Mass.

DEARBORN Drug & Chemical Works, Chicago, Ill.

DIXON, Jos., Crucible Co., Wayne and Monmouth Sts., Jersey City, N. J.

ECONOMY Oil & Compound Co., 442 Clark St., Chicago, Ill.

EMERY Mfg. Co., 41 Main St., Bradford, Pa.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

Fiske Bros. Refining Co., 13-15 Old Slip, N. Y. City (see page 81).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

GALENA Signal Oil Co., Franklin, Pa.

GALLAWAY, G. W., 322 Pearl St., New York.

HARRIS, A. W., Oil Co., 330 Water St., Providence, R. I. (see back cover).

HAVEMEYER Oil Co., 78 Broad St., N. Y. City.

HAWS, George A., 73 Pine St., N. Y. City.

HOFFMAN Lubricating Oil Co., Binghamton, N. Y.

KANTER Co., R. J., 647 Water St., N. Y. City.

KELLOGG, E. H., Co., 243-244 South St., N. Y. City.

KELLOM & Co., Chas. F., 128 Arch St., Philadelphia, Pa.

MACLEAN Oil & Supply Co., 463 Atlantic Ave., Boston, Mass.

MAGIE Bros., 9-11 No. Canal St., Chicago, Ill.

MARION Mfg. Co., Franklin, Pa.

MILLER'S Sons, Wm. P., 75-79 Third St., Long Island City, N. Y.

MONARCH Mfg. Co., Toledo, O.

MOTOR Car Supply Co. (The) 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

MOUND CITY Oil & Supply Co., 203-205 North Levee, St. Louis, Mo.

NATIONAL Cement & Rubber Mfg. Co., 3053-59 Monroe St., Toledo, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

N. Y. & N. J. Lubricant Co., 15 Church St., N. Y. City (see page 75).

NYE, Wm. F., New Bedford, Mass.

OIL City Oil & Grease Co., Oil City, Pa.

O-U-T-O Co. (The), 19 Camfield St., Newark, N. J.

PARAGON Refining Co. (The), Toledo, O.

PENN Oil & Supply Co., Chicago, Ill.

PENN Petroleum Co., 117 N. 2d St., Philadelphia, Pa. (see page 115).

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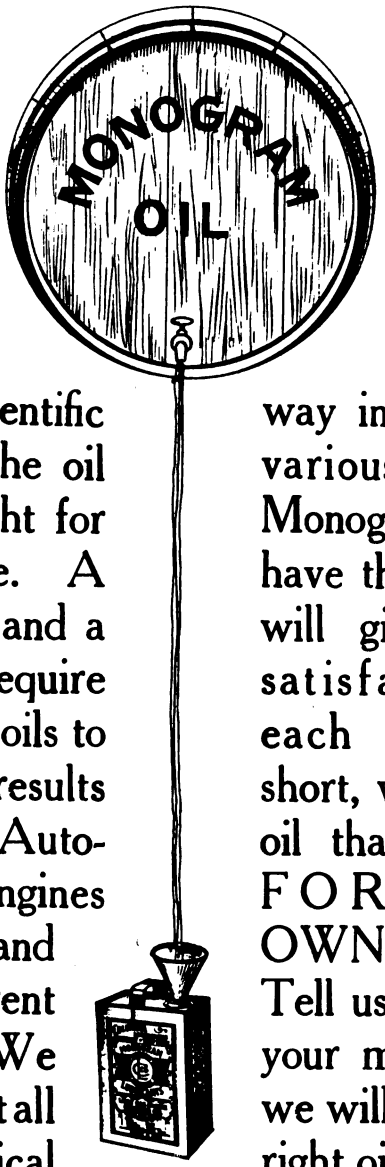
Monogram Oil

Best for Your Engine



Best for Your Engine

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If you are interested to know more about oils, write us. Monogram Oil is carried in stock by 5,000 dealers. Sold in any quantity desired.

Columbia Lubricants Co. of New York

78 BROAD ST., NEW YORK

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PHILADELPHIA Grease Mfg. Co., Philadelphia, Pa.

PIGOT, Sayre & Co., 135 William St., N. Y. City.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

PULVER & Sons, Peter, N. Y. City.

RELIANCE Oil & Grease Co., 12 S. Water St., Cleveland, O.

RICHARDSON Lubricating Co., Quincy, Ill.

ROBINSON, Son & Co., Wm. C., Baltimore, Md.

ROYAL Lub. Oil Co., 116 Broad St., N. Y. City.

ROYAL Oil Co., 2 Platt St., N. Y. City.

SPEAR'S Sons Co., The Alden, 369 Atlantic Ave., Boston, Mass.

STANDARD Oil Co., 26 Broadway, N. Y City.

STAR Lubricating Co., N. Y. City.

STERLING Oil Co., Emlenton, Pa.

SWAN & Finch Co., 151 Maiden Lane, New York.

UNDERHAY Oil Co., 275 Franklin St., Boston, Mass.

VACUUM Oil Co., Rochester, N. Y.

VALVOLINE Oil Co., N. Y. City.

VISCOSITY Oil Co., 21 River St., Chicago, Ill.

WADHAMS Oil Co., Milwaukee, Wis.

WINN, F. R., Co., 147 Maiden Lane, N. Y. City.

YOUNG, O. W., Newark, N. J.

OILS (Semi-Solid)

COLUMBIA Lubricants Co. of New York, 78 Broad St., N. Y. City (see page 113).

HARRIS Oil Co., A. W., 330 So. Water St., Providence, R. I. (see back cover).

N. Y. & N. J. Lubricant Co., 14 Church St., New York (see page 75).

OIL CANS

AKRON Mfg. Co., 927 S. Hight St., Akron, O.

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co. (The), 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BROWN Oil Can Co., Toledo, O.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

GEM Mfg. Co., Pittsburg, Pa.

MANUFACTURERS' Can Co., Mulberry and South Sts., Newark, N. J.

MAPLE City Mfg. Co., Monmouth, Ill.

MOSHER, M. E., Rochester, N. Y. (see page 67).

MOTOR Car Supply Co. (The), 1425-1427 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

NOERA Mfg. Co., Waterbury, Conn.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

SAFETY Oiler Co., 65 Nassau St., N. Y. City.

SCOVILL Mfg. Co., Waterbury, Conn.

SMITH, S. W., Keithsburg, Ill.

WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill. (see page 145).

OIL CUPS

AURORA Automobile Mach. Co., Aurora, Ill.

BAY State Stamping Co., 380 Chandler St., Worcester, Mass.

BOWEN Mfg. Co., Auburn, N. Y.

DETROIT Lubricator Co., Lincoln Ave. and G. T. R. R., Detroit, Mich.

DURYEA Power Co., Reading, Pa.

ESSEX, G. B., Brass Co., 480 Franklin St., Detroit, Mich.

LUNKENHEIMER Co. (The), Cincinnati, O.

SHERWOOD Mfg. Co., Buffalo, N. Y.

STAR Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

TUCKER, W. W. & C. F., Hartford, Conn.

WINKLEY Co. (The), Detroit, Mich.

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is lighter in color than No. 1, and has a lower fire test and a better cold test and for use in cold weather.

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is lemon color and is recommended for gasoline and heavy electric vehicles, on account of its viscosity and high fire test and non-carbonizing qualities.

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OIL GUNS

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page opposite).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

COLUMBIA Lubricants Co. of New York, 78 Broad St., N. Y. City (see page 113).

ELKHART Brass Mfg. Co., Prospect St., Elkhart, Ind.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-AMERICAN Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 37).

GLEASON-Peters Air Pump Co., 20 West Houston St., New York.

MANHATTAN Screw Lamp Co., 7th Ave. and 11th St., N. Y. City.

MOSHER, M. E., Rochester, N. Y. (see page 67).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

N. Y. & N. J. Lubricants Co., 15 Church St., New York (see page 75).

NOERA Mfg. Co., Waterbury, Conn.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

RANDALL-Faichney Co., Boston, Mass. (see page 67).

SEEBACH, R., 32 Vesey St., N. Y. City.

OIL-HOLE COVERS

BAY State Stamping Co., 380 Chandler St., Worcester, Mass.

BOWEN Mfg. Co., Auburn, N. Y.

BOWN Machine Works, Battle Creek, Mich.

TUCKER, W. W. & C. F., 302 Asylum St., Hartford, Conn.

WINKLEY Co. (The), Detroit, Mich.

OIL PUMPS

BOSTON Auto Exch., 173-177 Berkeley St., Boston, Mass.

DETROIT Lubricator Co., Lincoln Ave. and R. R., Detroit, Mich.

EASTERN Oil Tank Co., 136 Fletcher St., Lowell, Mass. (see page opposite).

ESSEX Brass Co., G. B., 480 Franklin St., Detroit, Mich.

IMPERIAL BRASS Mfg. Co., 251 So. Jefferson St., Chicago, Ill.

LAVIGNE Mfg. Co., 132 E. Larned St., Detroit, Mich.

MADISON-Kipp Mfg. Co., Madison, Wis.

MANZEL Bros. Co., 313 Babcock St., Buffalo, N. Y. (see page 97).

M'CORD & Co., Old Colony Bldg, Chicago, Ill. (see page 31).

NOERA Mfg. Co., Waterbury, Conn.

SHERWOOD Mfg. Co., Buffalo, N. Y.

SIGHT Feed Oil Pump Co., 1148 Holton St., Milwaukee, Wis.

STAR Brass Mfg. Co., 108-114 E. Dedham St., Boston, Mass.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

PACKING

AMERICAN Steam Packing Co., Boston, Mass.

Booth, N. E., 743-45 39th St., Brooklyn, N. Y. (see page 177).

BOSTON Woven Hose & Rubber Co., 29 Hampshire St., Cambridge, Mass.

CHESTERTON & Co., A. W., 64 India St., Boston, Mass.

CHICAGO Rawhide Mfg. Co., 75-77 Ohio St., Chicago, Ill.

EAGLE Oil & Supply Co., 104 No. Broad St., Boston, Mass.

GOULD Packing Co., 88 E. Cambridge St., E. Cambridge, Mass.

GREENE, Tweed & Co., 17 Murray St., N. Y. City.

JOHNS-Manville, H. W., Co., 100 William St., N. Y. City.

KEASBEY, Robert A., 83 Warren St., N. Y. City.

KEASBY-Mattison Co., Ambler, Pa.

N. J. Asbestos Co., Camden, N. J.

PAINTS

ACME White Lead & Color Works, Detroit, Mich.

BERRY Bros., Ltd., Detroit, Mich. (see front cover).

BILLINGS-Chapin Co. (The), Cleveland, O.

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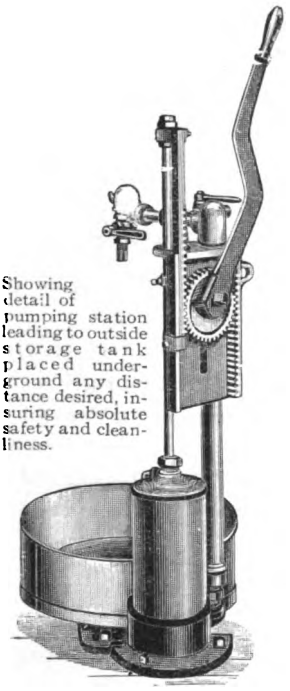

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DETROIT White Lead Wks., 532 Milwaukee St., Detroit, Mich.

DITZLER Paint & Color Works, 14 Baltimore Ave., West Detroit, Mich.

FELTON, Sibley & Co., 136-140 No. 4th St., Philadelphia, Pa.

GRAVES & Congdon Co., Oak St., Amesbury, Mass.

MASURY & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

PATTERSON-Sargent Paint Co., Cleveland, Ohio.

SCHRACK, C., & Co., 152 No. 4th St., Philadelphia, Pa.

SHERWIN-Williams Paint Co., 100 Canal St., Cleveland, O.

STANDARD Varnish Works, 29 Broadway, N. Y. City (see page 165).

VALENTINE & Co., 257 Broadway, N. Y. City.

PANELS (Wood)

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J. (see page 17).

BOTHNER Hardwood Moulding Co., 1945 Park Ave., N. Y. City.

DANN Bros. Co. (The), 80 Franklin St., New Haven, Conn.

OHIO Scroll & Lumber Co., Covington, Ky.

PANS (Drip)

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

HAYES Mfg Co., 360-70 Maybury Ave., Detroit, Mich. (see page opposite).

PATTERN MAKERS

BALKWILL Pattern Works, 970 Hamilton St., Cleveland, O.

GARDAM & Son, Wm., 45 Rose St., N. Y. City.

HARTFORD Pattern & Model Co., Inc. (The), 14 Hicks St., Hartford, Conn.

HOPSON-Chapin Mfg. Co., New London, Conn.

MANUFACTURERS Fdry. Co., Waterbury, Conn.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 31).

MEISEL Press & Mfg. Co., 944-948 Dorchester Ave., Boston, Mass.

MODEL Pattern Works, Washington and Perry Sts., Buffalo, N. Y.

OLMSTEAD, H. B. Co., 663 Manhattan Ave., Brooklyn, N. Y.

PARSELL & Weed, 129-131 W. 31st St., N. Y. City.

STANDARD Pattern Works, Detroit, Mich.

PIPE (Wrought Iron and Steel)

BYERS & Co., A. M., Pittsburg, Pa.

CONSHOHOCKEN Tube Co., Conshohocken, Pa

CRANE Co., Chicago, Ill.

HARRISBURG Pipe & Pipe Bending Co., Harrisburg, Pa.

LA BELLE Iron Works, Steubenville, O.

MARK Mfg. Co., Evanston, Ill.

NATIONAL Tube Co., New York, N. Y.

READING Iron Co., Reading, Pa.

SHELBY Steel Tube Co., Pittsburg, Pa.

SOUTH CHESTER Tube Co., Chester, Pa.

SPANG, Chalfant & Co., Pittsburg, Pa.

UNITED STATES Tube & Iron Co., Pittsburg, Pa.

WESTERN Tube Co., Kewanee, Ill.

YOUNGSTOWN Iron, Steel & Tube Co., Youngstown, O.

PIPE COILS

BLISS-Chester Co., Providence, R. I.

NATIONAL Pipe Bending Co., New Haven, Conn.

WHITLOCK Coil Pipe Co. (The), Hartford, Conn. (see page 85).

PISTON RINGS

HAGUE & Co., 6123 Penn Ave., E. Pittsburg, Pa.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

JORDEN, R. H., 110 Sheridan St., Allegheny, Pa.

PLATINUM

AMERICAN Platinum Works, Newark, N. J.

BAKER & Co., 408 N. J. R. R. Ave., Newark, N. J

CROSELMIRE Co., C. F., 251 N. J. R. R. Ave., Jersey City, N. J.

GOLDSMITH Bros., Chicago, Ill.

PLATING (Brass and Nickel)

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 99).

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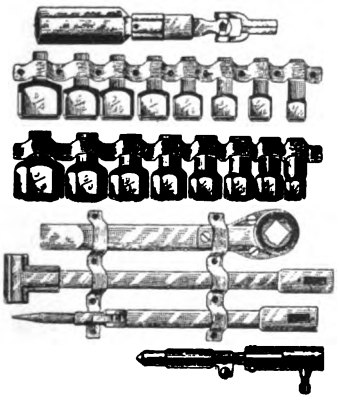

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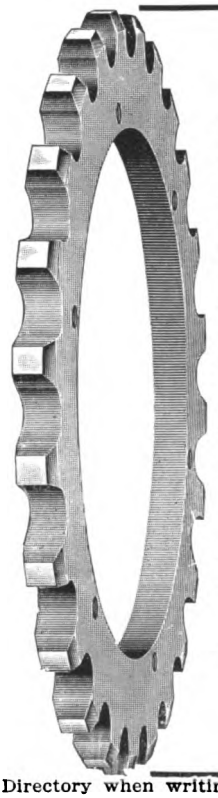

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TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

PLIERS AND NIPPERS (See Tools)

POLISHERS (Body and Metal)

ADAMS & Elting Co., 155 W. Washington St., Chicago, Ill.

AMER. Metal Polish Co., 89 Winslow Ave., W. Somerville, Mass.

AUTOMOBILE Specialty Co., 509 Willoughby Bldg., Chicago, Ill. (see page 141).

BADGER Chemical Mfg. Co., 143 Reede St., Milwaukee, Wis.

BELL Mfg. Co. (The), 113 Morgan St., St. Louis, Mo.

BOTT Bros. Mfg. Co. (The), 166 N. High St., Columbus, O.

BUFFALO Enamel & Stain Co., 481 Ellicott Sq., Buffalo, N. Y.

BUFFALO Specialty Co., 3751-77 Ellicott St., Buffalo, N. Y.

COLE, G. W. Co., 143 Broadway, New York City.

CROSS, W. H., 18 Franklin St., Brooklyn, N. Y.

EAGLE Mfg. Co., 383 Prospect St., Cleveland, Ohio.

FAIRCHILD & Bro., M. H., 119 Michigan St., Chicago, Ill.

GRAMLICH Chemical Co., 167 Leverett St., Detroit, Mich.

HARRIS, A. W., Oil Co., 330 S. Water St., Providence, R. I. (see back cover).

HASSLER Co., Owen C., 565 W. Fullerton Ave., Chicago, Ill. (see page opposite).

HINDS & Coon, 126 Pearl St., Boston, Mass.

HOFFMAN, Geo. W., 551 E. Washington St., Indianapolis, Ind.

HOLLINGSHEAD Co., The R. M., Camden, N. J.

KLENZENE Co., 1710-1712 Market St., Philadelphia, Pa

LEAVITT, Gilbert, 11 India St., Boston, Mass.

LORD Polish Co., F. T., Cambridge, Mass.

LUSTRE Chemical Co., 1303 Michigan Ave., Chicago, Ill.

MAGIE Bros., 9-11 N. Canal St., Chicago, Ill.

MARSHALL Chemical Co., 80 William St., New York.

MEXICAN Mfg. Co. (The), 239 S. Main St., Wichita, Kan.

MONARCH Mfg. Co., Toledo, O.

NATIONAL Cement & Rubber Mfg. Co., 3055 Monroe St., Toledo, O.

NEWBERN Co., S. C., 430 Walnut St., Philadelphia, Pa.

ORIENT Mfg. Co., 141 Milk St., Boston, Mass. (see page opposite).

PAUL, J. C., & Co., 59 Dearborn St., Chicago, Ill. (see page 65).

PURITAN Soap Co., 502 Exchange St., Rochester, N. Y.

RAIMES & Co., 50 Ferry St., N. Y. City. (see page opposite).

RATH Mfg. Co., Hancock, Laurel and Second Sts., Philadelphia, Pa.

ROYAL Polish Co., 301-303 W. 63d St., Chicago, Ill. (see page 145).

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

SPEAR'S Sons Co., Alden (The), 369 Atlantic Ave., Boston, Mass.

VELOX Chemical Co., Dexter Bldg., Chicago, Ill.

PORCELAIN (Insulators)

AMERICAN Lava Co., Chattanooga, Tenn.

BISHOP Gutta-Percha Co., 425 E. 25th St., New York City.

BRUNT Porcelain Works, G. F., E. Liverpool, O.

IMPERIAL Porcelain Works (The), Trenton, N. J.

MASSACHUSETTS Chemical Co., 170 Summer St., Boston, Mass.

PASS & Seymour, Syracuse, N. Y.

STANDARD China Works, Trenton, N. J.

STAR Porcelain Co., Trenton, N. J.

STATE Line Mfg. Co., Chattanooga, Tenn.

SUN-LIGHT Acetylene Gas Burner Co., 21 Market Sq., Chattanooga, Tenn.

PORTABLE CRANES AND HOISTS

FRANKLIN Portable Crane & Hoist Co., Franklin, Pa.

NICHOLS, Wm. S., 253 Broadway, New York.

NILES-Bement-Pond Co., 111 Broadway, N. Y. City.

PRESSED STEEL PRODUCTS

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 75).

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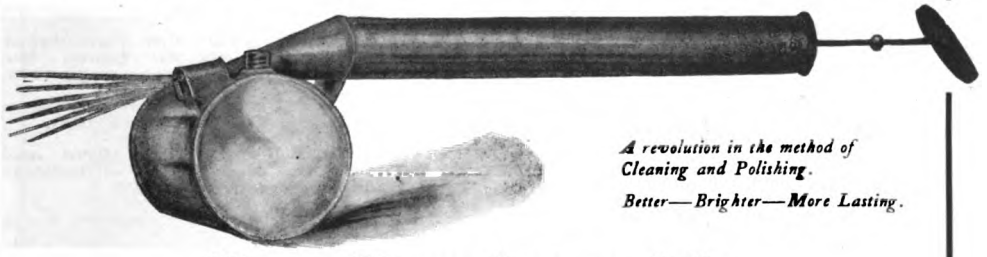

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KINSEY Mfg. Co., Dayton, O. (see page 83).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

PARISH & Bingham, Cleveland, O.

SMITH Co., A. O., Milwaukee, Wis.

WORCESTER Pressed Steel Co., Worcester, Mass.

PUMPS (Fuel, Air)

AMERICAN Steam Pump Co., Battle Creek, Mich.

BOSTON Auto Exchange, 177 Berkeley St., Boston, Mass.

BRIDGEPORT Brass Co., Bridgeport, Conn.

CLEVELAND Faucet Co., (The), Cleveland, Ohio.

LEATHER and Brass Mfg. Co., Auburn, N. Y.

REASON Automatic Air Pump Co., Pontiac, Mich.

RUMSEY & Co., Seneca Falls, N. Y.

SHAFFER Machine & Mfg. Co. (The), 211 No. Calvert St., Baltimore, Md.

UNION Steam Pump Co., Battle Creek, Mich.

PUMPS (Boiler)

AMERICAN Steam Pump Co., Battle Creek, Mich.

BLAKE Steam Pump Co., 356 Arborway, Jamaica Plain, Mass.

KILBURN, Edwin, Spring Valley, Minn.

OFELDT & Sons, August, 123 Liberty St., New York.

OFELDT & Sons, F. W., Nyack-on-the-Hudson, N. Y.

UNION Steam Pump Co., Battle Creek, Mich.

PUMPS (Circulating)

AMER. Mach. & Mfg. Co., Cleveland, O.

AUTO & Power Appliance Co. (The), Cleveland, O. (see page 103).

DIEDERMAN, C., 1555 Knox St., Cincinnati, Ohio.

BRENNAN Motor Co., Syracuse, N. Y.

BROWN & Sharpe Mfg. Co., Providence, R. I.

BYRNE, Kingston & Co., Kokomo, Ind.

ESSEX Brass Co., G. B., Detroit, Mich.

GARVIN Machine Co., Spring & Varick Sts., N. Y. City.

IMPERIAL Brass Mfg. Co., 251 So. Jefferson St., Chicago, Ill.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

LIPMAN Mfg. Co., Beloit, Wis.

LOBEE Pump & Machinery Co., 140-152 Terrace, Buffalo, N. Y.

McCORD & Co., 1700 Old Colony Bldg., Chicago, Ill. (see page 31).

MILWAUKEE Motor Co., Milwaukee, Wis.

N. Y. Gear Wks., Brooklyn, N. Y.

OBERDORFER Brass Co., M. L., Syracuse, N. Y.

PELTON Gas. Eng. Wks., Lyons, La.

ROSS & Kramer, 5607 So. Halsted St., Chicago, Ill.

STEEL Ball Co., 832-840 Austin Ave., Chicago, Ill.

TORBENSEN Motor Car Co., Bloomfield, N. J.

PUMPS, OIL (See Oil Pumps)

PUMPS (Tire Inflators)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

ARTIZAN Bros Co., 204 Lincoln Park Blvd., Chicago, Ill.

AUTO Pump Co., Springfield, N. Y.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BELL, D. M., Franklin and Michigan Sts., Chicago, Ill. (see page 107).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BRIDGEPORT Brass Co., Bridgeport, Conn.

BROWN-Lipe Gear Co., Syracuse, N. Y. (see page 77).

CLEVELAND Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

COLONIAL Brass Co. (The), 316-318 Seneca St., Cleveland, O.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FERODOWILL Mfg. Co., St. Paul, Minn.

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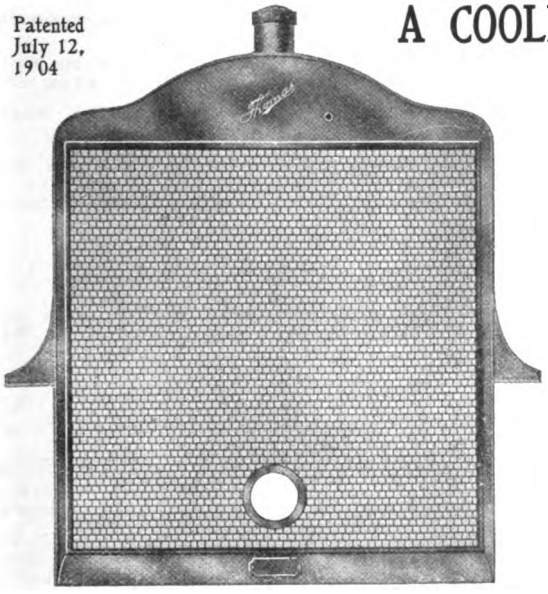

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HERZ & Co., 203-205 Lafayette St., New York.

IMPERIAL Brass Mfg. Co., 251 So. Jefferson St., Chicago, Ill.

JUDD & Leland, Clifton Springs, N. Y.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

MANHATTAN Brass Co., 328 E. 28th St., N. Y. City.

MANHATTAN Screw & Lamp Co., 7th Ave. and 11th St., N. Y. City.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 31).

MILLER Mfg. Co., Peekskill, N. Y.

MOTOR Car Specialty Co., Fidelity Mutual Bldg., Philadelphia, Pa.

MOTOR Car Supply Co. (The), 425-427 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

PACIFIC Tucking & Mfg. Co., 471 18th St., Brooklyn, N. Y.

POPE Mfg. Co., Hartford, Conn. (Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

PREST-O-Lite Co. (The), Indianapolis, Ind.

ROTARY Triplex Pump Co., 126-128 So. Jefferson St., Chicago, Ill.

SKINNER & Skinner, 1337 Michigan Ave., Chicago, Ill.

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page 51).

STEVENS & Co., 99 Chambers St., N. Y. City (Jobbers).

TILEY-Pratt Co. (The), Essex, Conn.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WRAY Pump & Register Co., Rochester, N. Y.

PUMP CONNECTIONS (Tire Valve)

GOODRICH, B. F., Co., Akron, Ohio.

JUDD & Leland Mfg. Co., Clifton Springs, N. Y.

KELLOGG, G. W., 9 Belmont St., Rochester, N. Y.

PARK City Brass Co., Springfield, Mass.

PARKER, E. N., 293 Main St., Springfield, Mass.

SCHRAEDER Sons, A., N. Y. City.

STEVENS & Co., 99 Chambers St., N. Y. City.

YOUSE, E. S., 46 N. 5th St., Reading, Pa.

RADIATORS

A-Z Co. (The), 527 W. 56th St., N. Y. City.

BLISS Chester Co., 31 Mathewson St., Providence, R. I.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 123).

DETROIT Auto Specialty Co., Detroit, Mich. (see page 65).

DIAMOND Stamped Ware Co., Detroit, Mich.

FEDDERS Mfg. Works, Buffalo, N. Y. (see page 123).

HAYES Mfg. Co., 360-70 Maybury Ave., Detroit, Mich. (see page 119).

HEWITT Motor Co., 10 E. 31st St., N. Y. City.

KELLS, W. J., Mfg. Co., Jersey City, N. J. (see page 85).

KINSEY Mfg. Co., Dayton, O. (see page 83).

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

LONG-Turney Mfg. Co., Rome, N. Y.

MAYO Radiator Co., New Haven, Conn. (see page opposite).

METAL Stamping Co., 398 Washington St., N. Y. City.

MOTOR Components Mfg. Co., 119-121 E. Walnut St., Des Moines, Ia.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 127).

PURSELL Mfg. Co., P. M., 802 Beecher St., Indianapolis, Ind. (see page 85).

WHITLOCK Coil Pipe Co. (The), Hartford, Conn. (see page 85).

WRIGHT Cooler & Hood Mfg. Co., 335 Wabash Ave., Chicago, Ill.

RIMS (Removable)

HARBURG Tire Co., 234 W. 58th St., N. Y. City (see page 163).

RIMS (Steel)

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

AUTOMOBILE Wheel & Rim Co. (The), 32 Hennepin Ave., Minneapolis, Minn.

BRYANT Steel Wheel & Rim Co., 454 Hayden Bank Bldg., Columbus, O.

CONTINENTAL Caoutchouc Co. (The), 43 Warren St., N. Y. City (Importers) (see page 189).

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CRAMP, James, 85 Summer St., E. Boston, Mass.

JAMESVILLE Mfg. Co., Jamesville, N. Y.

KELLY, Maus & Co., Lake St. Bridge, Chicago, Ill.

MIDGLEY Mfg. Co., Columbus, O.

STANDARD Welding Co. (The), 35 Cone St., Cleveland, O.

WESTON-Mott Co., Flint, Mich.

RIMS (Wood)

HAGERSTOWN Spoke & Bending Co., Hagerstown, Ind.

JONES & Co., Phineas, Newark, N. J. (see page 189).

K. & C. Mfg. Co., Henicker, N. H.

RASTETTER, Louis, & Son, Ft. Wayne, Ind.

TUCKER Woodwork Co. (The), Sidney, O.

ROBES (Auto)

AMER, Buffalo Robe Co., Buffalo, N. Y.

CHASE Co., L. C., Boston, Mass. (see page 159).

CHICAGO Auto Robe Supply Co., 155-159 Market St., Chicago, Ill.

DAVIS Robe Co., Inc., 1307 Champlain Bldg., Chicago, Ill.

DUSENBURY, Louis, 86-88 Worth St., New York.

DRAPER Bros., Canton, Mass.

GAUSLER & Starr, Philadelphia, Pa.

MORAWETZ Co. (The), Milwaukee, Wis.

PARSONS Buggy Top Co., Chicago, Ill.

PIONEER Woolen Mills, Beaufait St. and Gratiot Ave., Detroit, Mich.

RILEY, Wm. B. & Son, 324-326 Market St., Philadelphia, Pa.

WESTERN Road Co., Detroit, Mich.

RODS (Brass and Copper)

CHICAGO Brass Co., Kenosha, Wis.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

HOLMES, Booth & Hayden Co. (The), Waterbury, Conn.

PEUGEOT Freres, 296 Broadway, New York (see page 7).

RANDOLPH-Clowes Co., Waterbury, Conn.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

RODS (Distance)

GARFORD Co. (The), Elyria, O.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

RUBBER CLOTH

CARR, F. S., 74 Pearl St., Boston, Mass. (see page 159).

CHASE Co., L. C., Boston, Mass. (see page 159).

EMPIRE Rubber Mfg. Co., Trenton, N. J.

HARTFORD Rubber Works Co., Hartford, Conn. (see pages 161-162).

LANDERS Bros. Co., Toledo, O.

MANUFACTURERS' Selling Co. (The), 1777 Broadway, N. Y. City.

MASS. Chemical Co., 170 Summer St., Boston, Mass.

MUTTY, L. J., 276 Devonshire St., Boston, Mass. (see page 157).

WESTERN Rubber Co., Goshen, Ind.

RUNNING GEARS

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 189).

GARFORD Co. (The), Elyria, O.

NEUSTADT Auto. & Supply Co., 826 S. 18th St., St. Louis, Mo. (see page opposite).

SMITH Co., A. O., Milwaukee, Wis.

TOWANDA Motor Vehicle Co., Towanda, Pa.

TORBENSEN Gear Inc., 615 Bloomfield Ave., Bloomfield, N. J.

WALKER & Co., E. C. 1913 Logan St., Louisville, Ky.

SCREWS

ATLAS Bolt & Screw Co., Cleveland, O.

BLAKE & Johnson, 125 E. Main St., Waterbury, Conn.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 155).

DETROIT Screw Works, Detroit, Mich.

HARTFORD Machine Screw Co., 476 Capitol Ave., Hartford, Conn.

KIRK-Latty Co., Cleveland, O.

MANHATTAN Screw & Lamp Co., 7th Ave. and 11th St., N. Y. City.

NATIONAL Screw & Tack Co., Cleveland, O.

NEW Britain Hdw. Mfg. Co. (The), New Britain, Conn.

PENINSULAR Milled Screw Co., Detroit, Mich.

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PROGRESSIVE Mfg. Co., Torrington, Conn.

UPSON Bolt & Nut Co., Cleveland, O.

WATERBURY Mfg. Co., Waterbury, Conn.

WESTERN Automatic Machine Screw Co. (The), Elyria, O.

SCREW MACHINE PRODUCTS

BLAKE & Johnson, Waterbury, Conn.

CHICAGO Screw Co., Chicago, Ill.

DETROIT Screw Works, Detroit, Mich.

HARTFORD Mach. Screw Co., Hartford Conn.

HATCHER Auto Parts Co. (The), 140 Viaduct, Cleveland, O. (see page 5).

ILLINOIS Screw Co., Chicago, Ill.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 31).

MACHINERY Forging Co., Hamilton and Marquette Sts., Cleveland, O.

MACK Mfg. Co., Thos. A., 401-417 St. Paul Ave., Jersey City, N. J.

NATIONAL Cycle Mfg. Co., Bay City, Mich.

NILES-Bement-Pond Co., 111 Broadway, N. Y. City.

PENINSULAR Milled Screw Co., Detroit, Mich.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WORCESTER Mach. Screw Co., Worcester, Mass.

SEATS (Auto)

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J. (see page 17).

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 155).

DANN Bros. Co. (The), 80-88 Franklin St., New Haven, Conn.

DAYTON Folding Tonneau Co., Dayton, O.

EMPIRE Gear & Top Co., 53 Mechanic St., Newark, N. J.

FELLWOCK Roll & Panel Co. (The), Evansville, Ind.

FRANTZ Body Mfg. Co. (The), Akron, O.

HALLIDAY, C. A., 42 Cedar St., Oneida, N. Y.

ITHACA Carriage Co., Ithaca, N. Y.

MICH. Auto. & Carriage Body Co., Detroit, Mich.

RATTAN Mfg. Co., New Haven, Conn.

WHIPPLE, R. W., Binghamton, N. Y.

SEATS (Dos-a-Dos)

HALLIDAY, C. A., Oneida, N. Y.

INDIANAPOLIS Dash Co., Indianapolis, Ind.

SCHUBERT Bros. Gear Co., Oneida, N. Y.

WHIPPLE, R. W., Binghamton, N. Y.

SECTORS

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 99).

SHAFTING (Flexible)

COATES Clipper Mfg. Co., Worcester, Mass. (see page 45).

STOW Flexible Shaft Co., Philadelphia, Pa

WHITE Dental Mfg. Co., Philadelphia, Pa.

SHELLS (Boiler, Copper)

HUNGERFORD Brass & Copper Co., New York, N. Y.

RANDOLPH-Clowes Co., Waterbury, Conn.

SHELLS (Boiler, Steel)

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 75).

PRESSED Steel Tank Co., Milawukee, Wis.

STANDARD Welding Co., Cleveland, O.

SHOCK ABSORBERS

AMERICAN Shock Absorber Co., Easton, Pa.

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (see page 111).

DIEZEMANN Shock Absorber Co., 1311 Hudson St., Hoboken, N. J.

GABRIEL Horn Mfg. Co., 934 Hamilton Ave., N. E., Cleveland, O. (see page 87).

GODSHALK & Co., E. H., Philadelphia, Pa.

GRAHAM & Goodman, 51-55 W. 93d St., N. Y. City.

HARTFORD Suspension Co., 67 Vestry St., N. Y. City.

HERCULES Auto Specialty Mfg. Co., Los Angeles, Cal.

HOTCHKIN, P. M., 4018 Lake Ave., Chicago, Ill. (see page 39).

INDIANAPOLIS Bolster Spring Co., Indianapolis, Ind.

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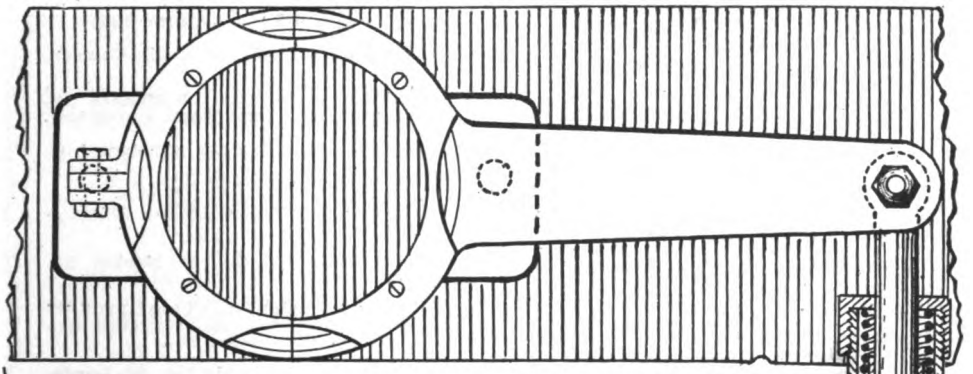

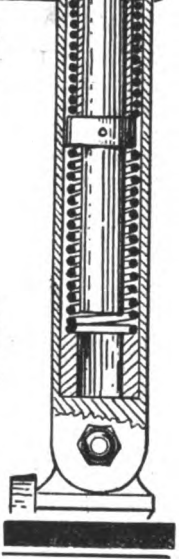

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MOTOR Supplementary Springs Co., Inc., 106 Fulton St., N. Y. City.

OIL Tempering Spring Co., Chicopee Falls, Mass.

RUCKERT Compound Shock Absorber, 66 Leonard St., N. Y. City.

SAGER Co., J. H., Rochester, N. Y.

SHEDDAN Mfg. Co., Baltimore, Md.

SUPPLEMENTARY Spiral Spring Co., 4528-4530 Delmar Ave., St. Louis, Mo. (see page 19).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

VESTAL Shock Absorber Co., Baum and Whitfield Sts., E. E., Pittsburg, Pa. (see page 129).

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

WEEBER Mfg. Wks., C. F., 170-172 Central Ave., Albany. N. Y.

WERNER Car Imp. Co., 110 W. 34th St., N. Y. City.

SOAPS (Special for Automobilists)

AMERICAN Oil Co., 170-178 So. Water St., Jackson, Mich.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BADGER Chemical Mfg. Co., Lake and Reed Sts., Milwaukee, Wis.

BAUM'S Castorine Co., Rome, N. Y.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BROWN, T. C., 402 Mutual Life Bldg., Buffalo, N. Y.

CLEANOLA Co. (The), Allegheny, Pa.

ERICKA Mfg. Co., Inc.. Springfield, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FISK Mfg. Co., Springfield, Mass.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

HASSLER Co., Owen C., 1543 Milwaukee Ave., Chicago, Ill. (see page 121).

HOLLINGSHEAD Co. (The) R. M., Camden, N. J.

HYDRO-Palm Soap Co., 22 Minott St., Neponsett, Mass. (see page opposite).

JERGENS Co. (The), Andrew, Cincinnati, O.

KIRK & Co., J. S., Chicago, Ill.

KLENZENE Co., 1710 Market St., Philadelphia, Pa.

MONAHAN Antiseptic Co., 92 Market St., Chicago, Ill.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

PURITAN Soap Co., 502 Exchange St., Rochester, N. Y.

ROME Soap Mfg. Co., Rome, N. Y.

SKAT Mfg. Co., 791 Park St., Hartford, Conn.

STANLEY, John T., 636 W. 30th St., N. Y. City (see page opposite).

UTILITY Co. (The), 233 Greenwich St., N. Y. City.

WALTKE & Co., Wm., Grand and 2d St., St. Louis, Mo.

SPARK COILS

AMERICAN Coil Co., Foxboro, Mass.

AMERICAN Machine Mfg. Co., East Braintree, Mass.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOCOIL Co. (The), 132 7th St., Jersey City, N. J.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BYRNE-Kingston Co., Kokomo, Ind.

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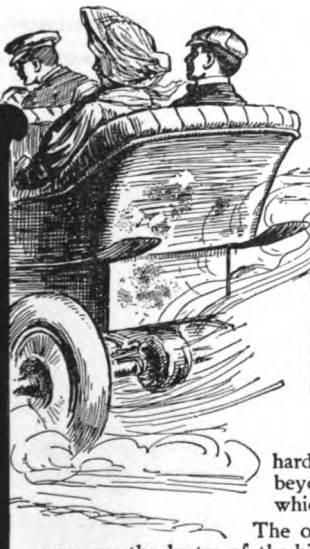

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DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 41).

DOW Portable Electric Co., Braintree, Mass.

DUPLEX Coil Co., Fond-du-Lac, Wis. (see page 173).

ELBRIDGE Electrical Co., Elbridge, N. Y.

ELECTRIC Contract Co., 202 Centre St., N Y. City.

ENGLAND, A. E., Amesbury Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FISCHER Special Mfg. Co., 2076 Reading Rd., Cincinnati, O.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

GEEN Electric Novelty & Mfg. Co., 183 Lake St., Chicago, Ill.

HARDY Co., R. E., New York, N. Y.

HEINZE Electric Co., Lowell, Mass. (see page 185).

HERZ & Co., 203-205 Lafayette St., N. Y. (Importers.)

INDUCTION Coil Co., 106 Wisconsin St., Milwaukee, Wis. (see page opposite).

KNOBLOCK-Heideman Mfg. Co., South Bend, Ind.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NATIONAL Coil Co., Lansing, Mich. (see page 107.)

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

NEVER-Miss Spark Plug Co., Lansing, Mich.

NEW York Coil Co., 52-54 Park Pl., N. Y. City.

NOXON, C. Per Lee, 500 East Water St., Syracuse, N. Y.

NUNGESSER Electric Battery Co. (The), 21 King St., Cleveland, O.

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 41).

POPE Mfg. Co., Hartford, Conn. (Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

PROVIDENCE Spark Coil Co., Summer and Meadow Sts., Providence, R. I. (see page opposite).

ROCHE, Wm., 52 Park Pl., N. Y. City.

RUBAY, Leon, 136 W. 38th St., New York. (Importers.)

RUPRECHT Electrical Co., 769 Cedar Ave., Cleveland, O.

SCHUG Electric Co. (The), 326 Jefferson Ave., Detroit, Mich. (see page 105).

SEIDLER-Miner Electric Co., Detroit, Mich. (see page 107).

SPLITDORF, C. F., 27 Vandewater St., New York (see page 109).

TRITT Electric Co., Union City, Ind.

U. S. Coil Co., Jersey City, N. J.

WILLIAMS, E. Q., 533 S. Clinton St., Syracuse, N. Y.

SPARK GAPS

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

HERZ & Co., 203-205 Lafayette St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

SPARK PLUGS

ALBRIGHT Mfg. Co., Inc., Columbus, Ga.

AMERICAN Coil Co., Foxboro, Mass.

AMERICAN Machine Mfg. Co., East Braintree, Mass.

ARC Spark Mfg. Co., 125 W. 32d St., N. Y. City.

ARC-Toledo Spark Plug Co. (The), Toledo, O.

ARMAC Motor Co., Cor. Sheldon and Carroll Aves., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

ATLANTIC Motor Supply & Screw Co., 48 Binford St., Boston, Mass.

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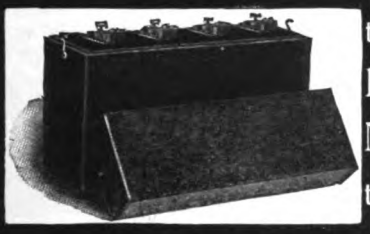

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AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

B. & J. Mfg. Co., 3985 Cottage Grove Ave., Chicago, Ill.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

E. M. Benford, 33 So. 13th Ave., Mount Vernon, N. Y.

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BYRNE, Kingston Co., Kokomo, Ind.

CHARTER Mfg. Co., 303 Dearborn St., Chicago, Ill.

CLIMAX Igniter Co., Amesbury, Mass.

DAYTON Electrical Mfg. Co. (The), 87 St. Clair St., Dayton, O. (see page 41).

DELTA Mfg. Co., Bloomfield, N. J.

DE LUXE Mfg. Co., Buffalo, N. Y.

DOW Portable Electric Co., Braintree, Mass.

DUPLEX Ignition Co., Inc., 1555 Broadway, N. Y. City.

ELBRIDGE Electrical Mfg. Co., Elbridge, N. Y.

ENGLAND, A. E., Amesbury, Mass.

EXCELSIOR Spark Plug Co., Cleveland, O.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FISCHER Special Mfg. Co., 2076 Reading Rd., Cincinnati, O.

FOURFORONE Spark Plug Co., 23 E. Lake St., Chicago, Ill.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

GERSON-Carey Co., Lansing, Mich.

GILBOUGH, B. G., 36 La Salle St., Chicago, Ill.

GEEN Elec. Novelty & Mfg. Co., 183 Lake St., Chicago, Ill.

HARDY Co., R. E., 86 Watt St., N. Y. City.

HOLCOMBE & Co., 45 Vesey St., N. Y. City.

ILLINOIS Roofing & Supply Co., 23 Lake St., Chicago, Ill.

IGNITER Appliance Co., 133 Central Ave., Cleveland, O. (see page 49).

INDUCTION Coil Co., Milwaukee, Wis. (see page 133).

KNOBLOCH-Heideman Mfg. Co., South Bend, Ind.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 31).

McCUTCHEON Gear & Mfg. Co., 205 W. South St., Indianapolis, Ind.

MECHANICAL Plug Co., St. Louis, Mo.

MEZGER, C. A., Inc., 203 W. 80th St., N. Y. City (see page 9).

MOSLER, A. R., & Co., 163 W. 29th St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 121).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

NEVER-Miss Spark Plug Co., Lansing, Mich.

OAKES & Dow Co., 15 Chardon St., Boston, Mass.

ORSWELL Ignition Co. (The), 102 Pearl St., Boston, Mass.

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 41).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

PROVIDENCE Spark Coil Co., Summer and Meadow Sts., Providence, R. I. (see page 133).

PURITAN Machine Co., 12 Gratiot Ave., Detroit, Mich.

RAJAH Auto. Supply Co., 140 Washington St., New York.

REX Motor Co., 69 Woodward Ave., Detroit, Mich.

RICHARDSON Engineering Co., Hartford, Conn. (see page opposite).

ROCHE, Wm., 52 Park Pl., N. Y. City.

RUBAY, Leon, 136 West 38th St., New York (Importer).

SCHUG Electric Mfg. Co. (The), 326 Jefferson Ave., Detroit, Mich. (see page 105).

SEIDLER-Miner Electric Co., 205-209 Jefferson Ave., Detroit, Mich. (see page 107).

SPLITDORF, C. F., 27 Vandewater St., New York (see page 109).

STANDARD Co. (The), Torrington, Conn.

THURSTON Mfg. Co. (The), 356 E. 57th St., Chicago, Ill.

TRITT Electric Co., Union City, Ind.

U. S. Coil Co., 60 Harrison Ave., Jersey City, N. J.

SPARKING POINTS

AMERICAN Platinum Wks., Newark, N. J.

BAKER & Co., 408 N. J. R. R. Ave., Newark, N. J.

BOKER & Co., Herman, 101 Duane St., N. Y. City.

CROSELMIRE, Chas. F., Co., 251 N. J. R. R. Ave., Newark, N. J.

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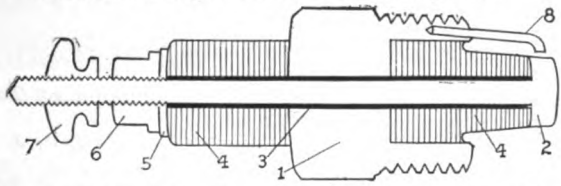
"RICH SPARK" PLUG

MOST PRACTICAL PLUG On the Market

ABSOLUTELY CANNOT BLOW OUT

No Shellac used in any part
Mica Finely Polished and stays so



(1) Brass shell (state make of Auto when ordering); (2) Firing pin, steel; (3) Best India sheet mica wrapped around 2 enough turns to give perfect insulation; (4) Best mica disks fit around 3 closely and forced together under great pressure; (5) Copper washer; (6) Brass nut to keep washer in place; (7) Thumb screw for wire or terminal; (8) Spark pin, non-corrosive alloy.

It has double insulation and from its construction it can be seen that pressure from inside the cylinder only tends to make it tighter. Note this plug is partly chambered, and yet the insulation projects out far enough to allow easy cleaning and to get the spark well into the cylinder, thus increasing the power of the engine. No packing is used, therefore none to loosen up or blow out.

PRICE, $1.00, and worth twice the money

Richardson Engineering Co., Hartford, Conn.

Liberal discount to manufacturers and dealers Write us

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ALTEMUS & Co., C. L., 15th and Market Sts., Philadelphia, Pa.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

AUTO Instrument Co., 228 No. 4th St., Philadelphia, Pa.

AUTO & Power Appliance Co. (The), Cleveland, O. (see page 103).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BEMUS, Inc., Alton T., 133 Oliver St., Boston, Mass.

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BURTT Mfg. Co., Kalamazoo, Mich.

CROUSE-Hinds Co., Syracuse, N. Y.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 41).

DODGE Lubricator Co., 8 Waltham St., Boston, Mass.

DOMINICK & Co., Wm., 542-544 Wabash Ave., Chicago, Ill.

DOW Portable Electric Co., Braintree, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

FULMER, C. F., Plainfield, N. J.

HAWKINS Mfg. Co., 508 Atlantic Ave., Boston, Mass.

HEINZE Electric Co., Lowell, Mass. (see page 185).

HERZ & Co., 203-205 Lafayette St., New York.

ILLINOIS Auto & Parts Co., Globe and Main Sts., Peoria, Ill.

MILWAUKEE Auto. Eng. & Supply Co., 706 Winnebago St., Milwaukee, Wis.

MONITOR Speed Recorder Co., 274 Pearl St., Cambridge, Mass.

MOSLER & Co., A. R., 163 West 29th St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 41).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

POWELL Muffler & Timer Co., Utica, N. Y.

Quad Mfg. Co. (The), 37 S. Scioto St., Columbus, O.

SINTZ, Guy L., Grand Rapids, Mich.

UNCAS Specialty Co., 31 Shipping St., Norwich, Conn.

WAUKESHA Motor Co., 119 North St., Waukesha, Wis.

WESTERN Motor Co., Logansport, Ind.

YOUSE E. S., Reading, Pa.

SPECIAL PARTS (See Machine Work to Order)

SPEED INDICATORS (See Indicators, Speed and Distance)

SPRINGS (Leaf)

ANSTED Spring & Axle Co., Connersville, Ind.

ARMSTRONG Mfg. Co. (The), J. B., Flint, Mich.

CLEVELAND-Canton Spring Co., Canton, O.

DELANEY, D., & Son, Liberty and Hamilton Sts., Newark, N. J.

DETROIT Steel Products Co., 93 East Fort St., Detroit, Mich. (see inside back cover).

FOREST City Spring Works, Cleveland, O.

GARDEN City Spring Works, 2000 Purple St., Chicago, Ill.

HESS-Pontiac Spring & Axle Co., Pontiac, Mich.

KALAMAZOO Spring & Axle Co., Kalamazoo, Mich.

KEYSTONE Spring Wks., Inc., 13th and Buttonwood Sts., Philadelphia, Pa.

LEWIS Spring & Axle Co., Jackson, Mich.

MERRILL Spring Co., E. R., 530 West 28th St., New York.

PENN Spring Wks., Baldwinsville, N. Y.

PERFECTION Spring Co., 249 The Viaduct, Cleveland, O. (see page opposite)

ROWLANDS, Wm. & Harvey, Frankford, Philadelphia, Pa.

RYMAN Co., K. L., 164 Market St., Newark, N. J.

SHULER, Davis W., & Son, Amsterdam, N. Y.

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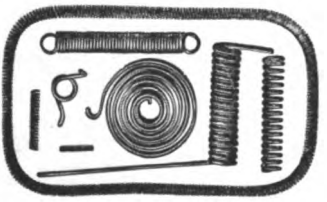
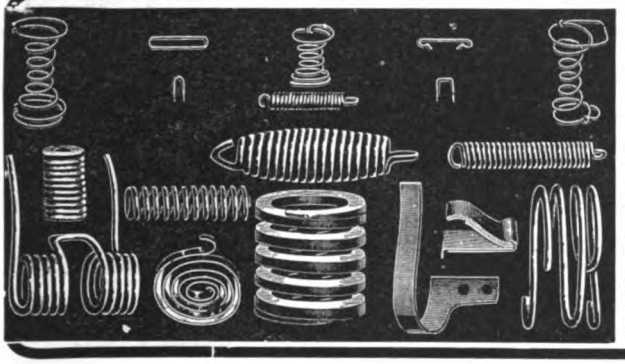
Small, Flat
Springs of any
Shape
for any Purpose



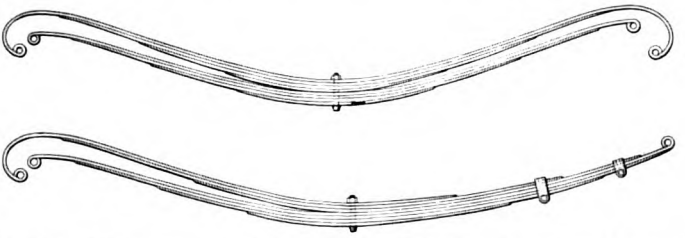
Coil Springs
Extensions
Compression
Torsion

M. D. HUBBARD SPRING COMPANY
Pontiac, Michigan



The Wm. D. Gibson Co.
Huron and Kingsbury Sts., Chicago
SPRINGS
SPIRAL and FLAT
Steel, Brass and Phosphor Bronze
Special Shapes and Sizes to meet all requirements of Automobile Makers.

Perfection Springs



Perfection Springs need no shock absorbers because they combine the sensitive action of a flexible spring with the strength of a stiff one. They automatically adjust themselves to the varying passenger weight. Perfection Springs are both a pleasure in riding and a protection from the wear and tear on the delicate machinery. Can be easily adjusted to any automobile.

We also make a general line of springs. Send for complete catalogue of our full line.

THE PERFECTION SPRING CO.
249 Viaduct, CLEVELAND, O.

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TROY Spring Works, 394-96 Congress St., Troy, N. Y.

TUTHILL Spring Co., 215 W. Polk St., Chicago, Ill.

WAUGH, T. Milton, 1525 Monadnock Blk., Chicago, Ill.

SPRINGS (Cushion and Machinery)

AMERICAN Steel & Wire Co., Chicago, Ill.

BARBER Mfg. Co., Anderson, Ind.

CARY Spring Works, 240 W. 29th St., N. Y. City.

CLEVELAND Wire Spring Co., Cleveland, Ohio.

D'ARCY Spring Co., Kalamazoo, Mich.

DETROIT Wire Spring Co., 295 Congress St., W., Detroit, Mich. (see page opposite).

DUNBAR Bros., Bristol, Conn.

GIBSON Co., Wm. D., Huron and Kingsbury Sts., Chicago, Ill. (see page 137).

HEBB, George A., 70 William St., Newark, N. J.

HUBBARD Spring Co., M. D., Pontiac, Mich. (see page 137).

INDEPENDENT Steel & Wire Co., House Bldg., Pittsburg, Pa.

JACKSON Cushion Spring Co., Water St., Jackson, Mich. (see page opposite).

MILLER & Van Winkle, 18 Bridge St., Brooklyn, N. Y.

MORGAN Spring Co., Worcester, Mass.

NATIONAL Spring & Wire Co., Albion, Mich.

NEW YORK Wire & Spring Co., Hoboken, N. J.

RAYMOND Mfg. Co., Corry, Pa.

SHELDON Spring Co., Wilkes Barre, Pa.

STAPLES & Hanford, Newburgh, N. Y.

THOMPSON, F. H., 36-38 Elm St., Portland, Me.

WALLACE Barnes Co. (The), Bristol, Conn. (see page opposite).

WINDSOR Spring Co. (The), Kenosha, Wis.

SPRINGS (Supplementary) (See Shock Absorbers)

SPROCKETS

ADAPT Machinery Co. (The), 17th St. and Wabash Ave., Chicago, Ill.

Baldwin Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (see page 111).

BILLINGS & Spencer Co., Russ and Lawrence Sts., Hartford, Conn.

BOSTON Gear Wks., Norfolk Downs, Mass.

COLLMER Bros., 105 Vistula Ave., South Bend, Ind.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

CULLMAN Wheel Co., 1030 Dunning St., Chicago, Ill. (see page 119).

DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapolis, Ind. (see page 57).

FORG, Peter, Park St., Somerville, Mass.

GARFORD Co. (The), Elyria, O.

GRANT Gear Wks., 6 Portland St., Boston, Mass.

NELSON, A., Mfg. Co., 67-69 So. Canal St., Chicago, Ill.

PARISH & Bingham Co., Hamilton St., Cleveland, O.

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page 51).

SPRINGFIELD Drop Forging Co., 187 Pratt St., Buffalo, N. Y.

STAMPINGS

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 93).

BAY State Stamping Co., Worcester, Mass.

BOWEN Mfg. Co., Auburn, N. Y.

CROSBY Co. (The), 185 Pratt St., Buffalo, N. Y.

DAVIS & Buxton, Worcester, Mass.

DIAMOND Stamped Ware Co., Detroit, Mich.

EATON, Cole & Burnham, 253 B'way, N. Y. City.

FORSYTH Mfg. Co., 308 Terrace, Buffalo, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

HANCOCK Inspirator Co., 85 Liberty St., N. Y. City.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 75).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

MACK Mfg. Co., Thos. A., 401-417 St. Paul Ave., Jersey City, N. J.

MATTHEWS, H. A., Mfg. Co., Seymour, Conn.

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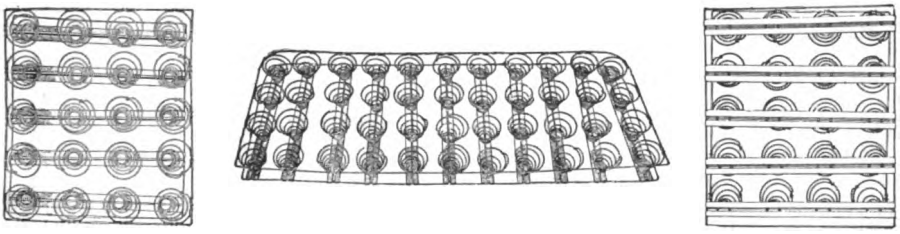
SEAT SPRINGS



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A Construction that has a smooth Steel Base.

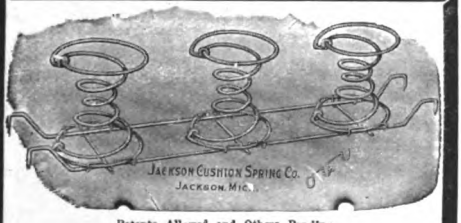
MADE WITH

SINGLE CONE SPRINGS

SO LOCKED THAT THERE IS NO CHANCE OF SLIPPING OR SLIDING

WRITE US

DETROIT WIRE SPRING CO. DETROIT, U.S.A



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THE CLIMAX OF EXCELLENCY IN A CUSHION SPRING IS REACHED WHEN THE SPRING IS MADE SO THAT IT LASTS AS LONG AS ANY OTHER PART OF THE MACHINE AND COMBINES RESISTANCE WITH ELASTICITY. YEARS OF EXPERIENCE IN THE MANUFACTURE OF SPRINGS HAS ENABLED US TO ACCOMPLISH THIS RESULT.

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SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

SIDNEY Mfg. Co., 5300 Armour Ave., Chicago, Ill.

SIMMONS, John, Co., 101 Centre St., N. Y. City.

SMITH Co., A. O., Milwaukee, Wis.

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

STAR Brass Mfg. Co., 108 E. Dearborn St., Boston, Mass.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WATSON, H. L., Co., Erie, Pa.

WORCESTER Pressed Steel Co., Worcester, Mass.

STARTERS (Automatic)

AUTO Improvement Co., 316 Hudson St., New York City.

BALL, F. H. & F. O., Plainfield, N. J.

STEEL

AMERICAN Sheet Steel Co., 24 State St., N. Y. City.

AMER. Tube & Stamping Co., Bridgeport, Conn.

BASSETT & Presley Co., Cleveland, O.

BOKER & Co., Herman, 101 Duane St., N. Y. City.

BROOKEBANK, Mullin & Co., 409 Commerce St., Philadelphia, Pa.

CARPENTER Steel Co., Reading, Pa.

COLUMBIA Steel Co., Elyria, O.

CRUCIBLE Steel Co. of America, Empire Bldg., Pittsburg, Pa.

ELIOTT-Blair Steel Co., Taylor and Mercer Sts., New Castle, Pa.

FARIST Steel Co. (The), 137 E. Main St., Bridgeport, Conn.

FINISHED Steel Co. (The), 1623 Wilson Ave., Youngstown, O.

JONES & Laughlins Co., Pittsburg, Pa.

LUKENS Steel Co., Coatsville, Pa.

MIDVALE Steel Co., Philadelphia, Pa.

MORRIS & Bailey Steel Co., Ger. Nat'l Bank Bldg., Pittsburg, Pa.

NASH, Geo., & Co., 224 Pearl St., N. Y. City.

PARDEE, C., Wks. (The), Perth Amboy, N. J.

PROSSER & Sons, Thos., 15 Gold St., N. Y. City.

REPUBLIC Iron & Steel Co., Stock Exchange Bldg., Chicago, Ill.

ROYAL Metal Steel Co., Inc., 24 State St., N. Y. City (see page opposite).

STANDARD Gauge Steel Co., Beaver Falls, Pa.

SUPERIOR Steel Co., Carnegie, Pa.

UNION Drawn Steel Co., Beaver Falls, Pa.

WARD, Edgar T. & Sons, 25 Purchase St., Boston, Mass.

STEEL (Chrome-Nickel)

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CARPENTER Steel Co., Reading, Pa.

COLUMBIA Steel Co., Elyria, O.

GAUTIER & Co., D. G., 20 Cliff St., New York.

MIDVALE Steel Co., Philadelphia, Pa.

ORFORD Copper Co., 43 Exchange Place, N. Y. City.

PARISH Mfg. Co., 7th and Chestnut Sts., Reading, Pa.

PROSSER & Sons, Thomas, 15 Gold St., New York (Importers).

ROYAL Metal Steel Co., Inc., 24 State St., N. Y. City (see page opposite).

TINDEL-Morris Co., Eddystone, Pa.

STEEL SHAFTING

CUMBERLAND Steel Co., Cumberland, Md.

PITTSBURG Steel Shafting Co., Braddock, Pa.

UNION Drawn Steel Co., Beaver Falls, Pa.

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QUINT, S. H., & Sons, 15 S. 4th St., Philadelphia, Pa.

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A Steel of the **Highest Quality**

EASY TO DROP FORGE AND TO MACHINE

Treatment doubles elastic limit and tensile strength.

The tensile strength of our Chrome Nickel Steel is 136,400 lbs. per square inch and the elastic limit is 127,680 lbs. per square inch.

We also recommend our

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High Speed Steel

This steel differs greatly from other air-hardening steels, in that it is much easier to work in annealing, forging and hardening, being strictly uniform, and will take at excessively high speeds very heavy cuts and feeds without drawing its temper.

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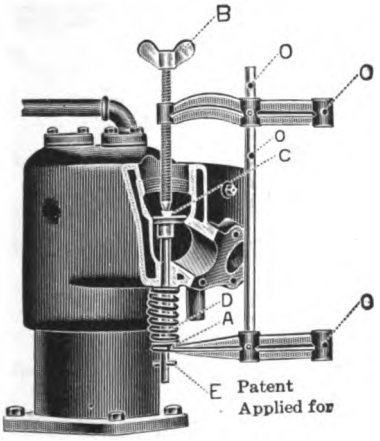

LIFTER COMPRESSING SPRING

Save Your Hands Save Time

Two Minutes to Remove Valve

W. & N.

Valve Lifter

It compresses the Spring and Lifts Washer so Key can be removed

No Loss of Patience No Injury to Hands
Simple Durable Practical

No owner of an Auto, Motor Boat, Gas or Gasoline Engine, or Garage as well, can afford to be without it.

Price, $2.00

DIRECTIONS

Place Fork "A" beneath washer or in coil of Spring "D." Turn Thumb Screw "B" until point sets on top of Valve "C." Then screw down until Spring "D" is compressed enough to remove Key "E"

To remove, back up on Screw "B," remove lifter and take out valve, so that necessary grinding, etc., can be done

To replace valve back in position, simply reverse above instructions.

"O" represents adjusting holes for different lengths of cylinders and to get over or under exhaust pipes.

AUTOMOBILE SPECIALTY CO. (Not Inc.)

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BARNES Gear Co., Oswego, N. Y.

BILLINGS & Spencer Co., Russ and Lawrence Sts., Hartford, Conn.

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 189).

BOSTON Gear Wks., Norfolk Downs, Mass.

BROWN-Lipe Gear Co., Syracuse, N. Y.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 93).

COLUMBUS Screw & Machine Co., Columbus, O.

GARFORD Co. (The), Elyria, O.

GEMMER Engine Co., Wabash, Ind.

GENERAL Electric Co., Schenectady, N. Y.

LEE Mfg. Co., Port Huron, Mich.

LEE & Porter, Buchanan, Mich.

MILNE, Frank, Everett, Mass.

MORSE, Williams & Co., West End Trust Bldg., Philadelphia, Pa.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 127).

ROSS Gear & Tool Co., 849 Main St., Lafayette, Ind.

SMITH, E. L., 43 Columbus Ave., Boston, Mass.

TIMKEN Roller Bearing Axle Co., Canton, O.

VANDERBEEK Tool Wks., Hartford, Conn.

WARNER Gear Co., Muncie, Ind.

STEERING WHEELS

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AMER. Wood Rim Co., Bradford, Pa.

BYRNE, Kingston & Co., Kokomo, Ind.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 93).

CENTAUR Motor Co., 59 Franklin St., Buffalo, N. Y.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

GARFORD Co. (The), Elyria, O.

GOERSS, Herman, 162 Russell Ave., Cleveland, O.

JAMESVILLE Mfg. Co., Jamesville, N. Y.

MUNCIE Auto Parts Co., Elliot St. and L. E. & W. R. R., Muncie, Ind.

RASTETTER & Son, Ft. Wayne, Ind.

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BLAKESLEE Forging Co., Plantsville, Conn.

CUSHING, J. M., Jamestown, N. Y.

DRUEN, B. D., 71 Hamilton St., New Haven, Conn.

HAYES Mfg. Co. (The), 360-70 Maybury Ave., Detroit, Mich. (see page 119).

QUINCY, Manchester, Sargent Co., 293 Dearborn Ave., Chicago, Ill. (see page 173).

RUBBER Step Mfg. Co., Exeter, N. H.

SMITH, H. D., & Co., Plantsville, Conn.

STRIEBY & Foote Co., 301 Ogden St., Newark, N. J.

WESTERN Automatic Machine Screw Co. (The), Elyria, O.

WING Co. (The) Chas., Amesbury, Mass.

STORM SHIELDS (See Aprons, Storm)

STRAINERS (Gasoline)

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 93).

CLARK, E. P., Arcade, Utica, N. Y.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

KAUFMANN, Chas., 45 So. Main St., Oshkosh, Wis.

LUNKENHEIMER Co. (The), Cincinnati, O.

MOTOR Car Specialty Co., Fidelity Mutual Bldg., Philadelphia, Pa.

TURNER Brass Wks., 72 Michigan St., Chicago, Ill. (see page 101).

SUPPLIES (Dealers and Jobbers)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (see page 155).

AUTOMOBILE Parts & Equipment Co., 2228 Michigan Ave., Chicago, Ill. (see page 147).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (see page 23).

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4, 6, 8 Volt, 40, 60 and 80 Amp.

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IMPORTED FRENCH COILS, PLUGS, MAGNETOS AND COMMUTATORS.

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BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (see page 27).

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (see page 69).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (see page 143).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 127).

POPE Mfg. Co., Hartford, Conn. (see page 91).

POST & Lester Co. (The), Hartford, Conn. (see page 81).

SWITCHES (Electric)

AMERICAN Coil Co., Foxboro, Mass.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTO Lock Co., 6546 Minerva Ave., Chicago, Ill.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

B. & J. Mfg. Co., Chicago, Ill.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BISSELL Co. (The) F., 226 Huron St., Toledo, Ohio.

BYRNE, Kingston & Co., Kokomo, Ind.

CONN. Telephone & Electric Co., Meriden, Conn.

DAYTON Electrical Mfg. Co., 87 St. Clair Se., Dayton, O. (see page 41).

DOW Portable Electric Co., Braintree, Mass.

ELDREDGE Elec. Mfg. Co., 7 Post Office Square, Springfield, Mass. (see page 23).

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

GOEBEL, F. A., Marietta, O.

HART & Hegeman Mfg. Co., Hartford, Conn.

HERZ & Co., 203-205 Lafayette St., New York.

McKIBBIN Mfg. Co., South Norwalk, Conn.

MORE-Power Co., 619 Gorham St., Lowell, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

PARKER, Henry F., 127 N. Fullerton Ave., Montclair, N. J.

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 41.)

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

SCHUG Electric Mfg. Co. (The), 326 Jefferson Ave., Detroit, Mich. (see page 105).

SEIDLER-Miner Electric Co., 205-209 Jefferson Ave., Detroit, Mich. (see page 107).

SPECIALTY Mfg. Co., South Norwalk, Conn.

SPLITDORF, C. F., 27 Vandewater St., New York (see page 109).

WESTERN Electric Co., 269 So. Clinton St., Chicago, Ill.

SWITCHES (Lock)

AUTO-Lock Plug Co., Inc., 31 Nassau St., N. Y. City.

GOEBEL, F. A., Marietta, O.

LOCK Switch Mfg. Co., 20 Broad St., N. Y. City.

TACHOMETERS (See Indicators, Speed and Distance)

TANKS

AVERY Stamping Co., 5209 Lakeside Ave., Cleveland, O. (see page 93).

A-Z Co. (The), 527 West 56th St., N. Y. City.

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BOWSER & Co., S. F., Ft. Wayne, Ind. (see page 147).

BOYD, James, 73 39th St., Brooklyn, N. Y.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 123).

DETROIT Auto Specialty Co., Detroit, Mich. (see page 65).

DIAMOND Stamped Ware Co., Detroit, Mich.

FEDDERS Mfg. Works, Buffalo, N. Y. (see page 123).

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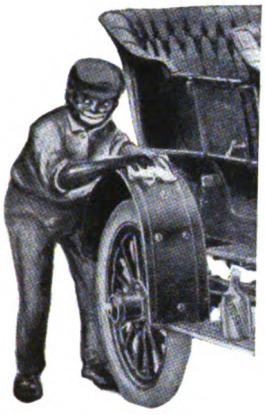

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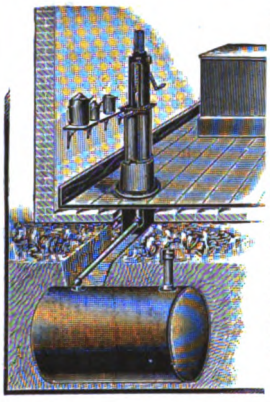

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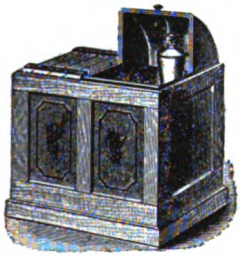

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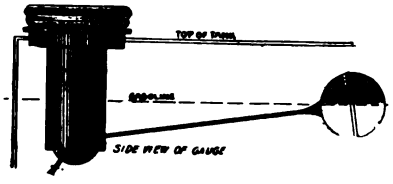

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GRAY & Sons, Peter, 90 Union St., Boston, Mass.

HAYES Mfg. Co., 360-70 Maybury Ave., Detroit, Mich. (see page 119).

IRONCLAD Mfg. Co., Brooklyn, N. Y.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 75).

KELLS, W. J., Mfg. Co., Jersey, City, N. J. (see page 85).

KINSEY Mfg. Co., Dayton, O. (see page 83).

KIRK-Latty Co., Cleveland, O.

MANUFACTURERS' Can Co. (The), 132-36 Mulberry St., Newark, N. J.

MAYO Radiator Co., New Haven, Conn. (see page 125).

NATIONAL Tank Co., Inc., Dayton, O. (see page 145).

PRESSED Steel Tank Co., Milwaukee, Wis.

PURSELL Mfg. Co., P. M., 802 Beecher St., Indianapolis, Ind. (see page 85).

STANDARD Welding Co., 41 Cone St., Cleveland, O.

TRAGESER Steam Copper Wks., John, 447-457 W. 26th St., New York.

WALKER & Son, James, Detroit, Mich.

WESTERN Oil Pump Co., 2447 Kosciusko St., St. Louis, Mo.

WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill. (see page 145).

WRIGHT Cooler & Hood Mfg. Co., Chicago, Ill.

TANKS (Gas Generating)

AMERICAN Generator Co. (The), 63d St. and Park Ave., N. Y. City.

TANKS (Storage)

AMERICAN Steel Barrel Co., 204-206 Varet St., Brooklyn, N. Y.

BOWSER & Co., S. F., Ft. Wayne, Ind. (see page opposite).

BOYER-Radford & Gordon Tank & Pump Co., Dayton, O.

BROWN Oil Can Co., Dawson St., Toledo, O.

EASTERN Oil Tank Co., 136 Fletcher St., Lowell, Mass. (see page 117).

GETSCHELL, S. S., & Sons, Woonsocket, R. I.

GILBERT & Barker Mfg. Co., 82 John St., N. Y. City.

GLEASON-Peters Air Pump Co., Mercer and Houston Sts., N. Y. City.

HYDRAULIC Oil Storage & Distributing Co., 820 Penobscot Bldg., Detroit, Mich.

IRONCLAD Mfg. Co., 204 Varet St., Brooklyn, N. Y.

KALTENBACH, Fred, 12 N. Jefferson St., Chicago, Ill.

NATIONAL Tank Co., Inc., Dayton, O. (see page 145).

SAFETY Tank Co., 25 W. 42d St., N. Y. City.

STOUTENBOROUGH, X., 277 Pearl St., N. Y. City.

TOKHEIM Mfg. Co., Cedar Rapids, Iowa.

WESTERN Oil Pump Co., 2447 Kosciusko St., St. Louis, Mo.

WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill. (see page 145).

TAPER PINS (See Screw Machine Products)

TIMERS (See Spark Timing Devices)

TIRES (Cellular)

BROOKE, M. E., Denver, Colo.

IDEAL Auto Tire Co., Detroit, Mich.

MILWAUKEE Rubber Works Co., Cudahy, Wis.

MITCHELL Punctureless Pneumatic Tire Co., Swampscott, Mass.

RUBBER Tire Co. (The), 1215 Arch St., Philadelphia, Pa.

VOORHEES Rubber Mfg. Co., Bostwick Ave., Jersey City, N. J.

TIRES (Leather)

AMERICAN Tire Co., Owosso, Mich.

CENTRAL Leather & Rubber Tire Works, 238-240 W. 50th St., N. Y. City.

SAMSON Leather Tire Co., 12 W. 33d St., N. Y. City.

TIRES (Pneumatic)

AJAX-Grieb Rubber Co., 420 East 106th St., New York.

CONTINENTAL Caoutchouc Co., 43 Warren St., N. Y. City (see page 189).

DIAMOND Rubber Co., Akron, O.

ELECTRIC Rubber Mfg. Co., Rutherford, N. J.

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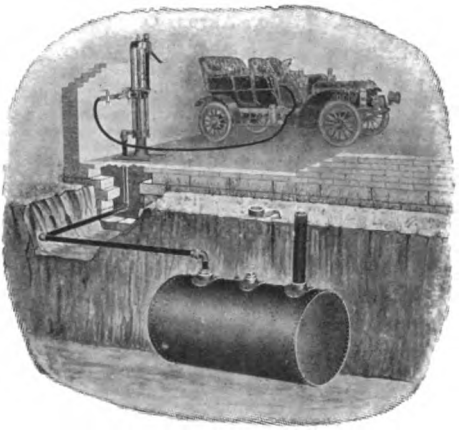

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Chanslor & Lyon Motor Supply Co.,
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Automobile Parts and Equipment Co.,
Chicago, Ill.

Gentlemen: As I have used one of your Storage Batteries in my automobile for two seasons, and found it perfectly satisfactory, I think it no more than right that I give you my experience with it. In the past twelve years I have handled, sold and used, many storage batteries, but never before have I seen or used one that gave as much satisfaction as your battery has given me.

My previous experience with storage batteries has been that they deteriorate rapidly. Yours seems to have an everlasting life, and holds its charge beyond all expectations.

You are at liberty to use this letter in any way you see fit. I can only say I have recommended to several of my friends to purchase your battery, and they all feel satisfied.

Hoping for your continued success, I am,

Yours very truly, THOS. A. ANDERSON, President and Treasurer.

The above letter is one of similar letters we are daily receiving.

Automobile Parts & Equipment Co., 2228 Michigan Ave., Chicago

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FISK Rubber Co., Chicopee Falls, Mass.

G & J Tire Co., 549 E. Georgia St., Indianapolis, Ind. (see page 13).

GAULIOS Tire Co., Broadway and 56th St., New York.

GOODRICH, B. F., Co., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

GOSHEN Rubber Works, Goshen, Ind.

HARBURG Tire Co., 234 W. 58th St., N. Y. City (see page 163).

HARTFORD Rubber Works Co., Hartford, Conn. (see pages 161-162).

INTERNATIONAL Auto. & Vehicle Tire Co., Milltown, N. J.

INTERNATIONAL Rubber Co., Akron, O.

KOKOMO Rubber Co., Kokomo, Ind.

MICHELIN Tire Co., 6 W. 29th St., N. Y. City.

MITCHELL Pneumatic Tire Co., Swampscott, Mass.

MORGAN & Wright, Detroit, Mich. (see page 187).

PENNSYLVANIA Rubber Co., Jeannette, Pa.

PUNCTUREPROOF Tire Co. (The), American Trust Co., Cleveland, O.

TIRES (Solid)

ALDEN Rubber Co., Barberton, O.

BATAVIA Rubber Tire Co., Batavia, N. Y.

CALUMET Rubber Tire Co. (The), 43d and Wabansia Ave., Chicago, Ill.

CONSOLIDATED Rubber Tire Co., 40 Wall St., N. Y. City.

DAVIE & Co., 1310-1314 Wallace St., Philadelphia, Pa.

DIAMOND Rubber Co., Akron, O.

EMPIRE Rubber Mfg. Co., Trenton, N. J.

FIRESTONE Tire & Rubber Co., Miller St. and Sweitzer Ave., Akron, O.

GOODRICH, B. F., Co., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

HARTFORD Rubber Wks. Co., Hartford, Conn. (see pages 161-162).

INDIA Rubber & Insulated Wire Co., Jonesboro, Ind.

INDIA Rubber Co., New Brunswick, N. J.

INTERNATIONAL Auto. & Vehicle Tire Co., Milltown, N. J.

KOKOMO Rubber Co., Kokomo, Ind.

MAHONING Rubber Co., Youngstown, O.

MORGAN & Wright, Detroit, Mich. (see page 187).

NEW Jersey Car Spring & Rubber Co., Jersey City, N. J.

NEW YORK Belting & Packing Co., 25 Park Pl., N. Y. City.

ONEIDA Rubber Tire Wks., Oneida, N. Y.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

R. & P. Traction Tread Tire & Tube Co., 1695 Broadway, New York City.

REPUBLIC Rubber Co. (The), Youngstown, Ohio.

REVERE Rubber Co., Boston, Mass.

ST. JOHN Rubber Tire Co., 116 Broad St., N. Y. City.

STEIN Double Cushion Tire Co., Akron, O.

SWEET Tire & Rubber Co. (The), Batavia, N. Y.

SWINEHART Clincher Tire & Rubber Co., Akron, O. (see page 187).

VICTOR Rubber Tire Co., Springfield, O.

TIRE ALARMS

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (see page 111).

TIRE CASES

ALLEN Auto Specialty Co., 1931 Broadway, N. Y. City.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co. Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BURGIN Bros., Springfield, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

GILBERT Mfg. Co., New Haven, Conn. (see page opposite).

HOPEWELL Bros., 42 Osborne St., Cambridge, Mass. (see page 93).

KIMBALL Tire Case Co., Council Bluffs, Ia.

LONDON Auto Supply Co., 1235 Michigan Ave., Chicago, Ill. (see page 153).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

MYERS Auto Top Co., Dayton, O. (see page 153).

NATHAN Anklet Support Co. (The), 38 Reade St., N. Y. City.

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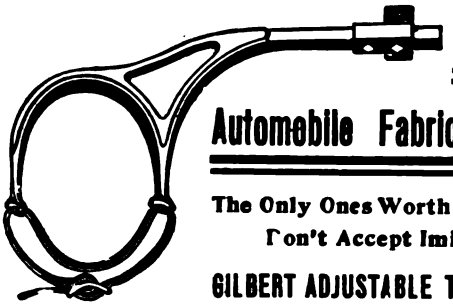

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POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

SEITZ, C., 207 E. 35th St., N. Y. City.

TEEL Mfg. Co., 132 Main St., Bedford, Mass.

WARNER Pole & Top Co., 1655 Central Ave., Cincinnati, O.

WILEY, Wm. H. & Son Co., Box 30, Hartford, Conn. (see page 149).

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ALLEN Auto. Specialty Co., 1931 Broadway, N. Y. City.

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (see page 111).

GILBERT Mfg. Co., New Haven, Conn. (see page 149).

LONDON Auto Supply Co., 1235 Michigan Ave., Chicago (see page 153).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (see page 21).

RANDS Mfg. Co., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

TIRE IRONS

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 75).

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DIAMOND Rubber Co., Akron, O.

GOODRICH, B. F., Co., Akron, O.

HUNTINGTON Automobile Co., Huntington, L. I., N. Y. (see page 9).

PNEUMATIC Tire Plug Co. (The), Danbury, Conn.

TINGLEY & Co., Chas. O., Rahway, N. J.

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BARNES, Henry K., 104 Franklin St., Boston, Mass.

BROWN Mfg. Co., J. C., Butler, Ind.

CHICAGO Rawhide Mfg. Co., 75 Ohio St., Chicago, Ill.

GILBERT Mfg. Co., New Haven, Conn. (see page 149).

HOWARD Mfg. Co., Attleboro, Mass.

HUMPHREYS, J., 1021 N. E. Payne Ave., Cleveland, O. (see page opposite).

KIMBALL Tire Case Co., Council Bluffs, Ia.

LEATHER Tire Goods Co., Newton Upper Falls, Mass. (see page 29).

MESINGER Mfg. Co., H. & F., 1801-1803 First Ave., N. Y. City.

MORE-Power Co., 619 Gorham St., Lowell, Mass.

PNEUMATIC Tire Protector Co., 14-16 S. St. Clair St., Dayton, O.

SLAMA Tire Protector Co., Humboldt, Neb.

TRAVER & McNamara, 1265 Broadway, Browning Bldg., New York (see page 179).

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CHANNON & Co., H., Market and Randolph Sts., Chicago, Ill. (see page 169).

COLE, G. W., Co., 143 B'way, N. Y. City.

DIAMOND Rubber Co., Akron, O.

GOODRICH, B. F., Co., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

HARTFORD Rubber Works Co., Hartford, Conn. (see pages 161-162).

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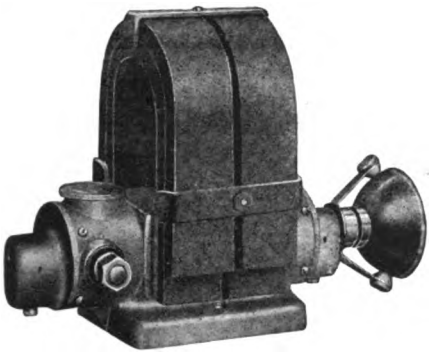

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MANNING Mfg. Co., Holyoke, Mass.

TIRE STRAPS

LEATHER Tire Goods Co., Newton Upper Falls, Mass. (see page 29).

TIRE TAPE

GOODYEAR Tire & Rubber Co., Akron, O.

MASS. Chemical Co., 200 Summer St., Boston, Mass.

NATIONAL Cement & Rubber Mfg. Co., 3053 Monroe St., Toledo, O.

NATIONAL India Rubber Co., Bristol, R. I.

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GOODRICH, B. F., Co., Akron, O.

HANCOCK & Heller, 184-190 Water St., Binghamton, N. Y.

LONG & MANN Co. (The), 527 Central Bldg., Rochester, N. Y. (see page 65).

MAXWELL & Co., L. R., Cedar Rapids, Ia.

MORGAN & WRIGHT, Chicago, Ill. (see page 187).

RHODES Mfg. Co., Grand Rapids, Mich.

UNEEDME Tire Tool Co., Columbus, O.

TIRE TUBES (Inner)

CONTINENTAL Rubber Wks., Erie, Pa.

ELECTRIC Rubber Mfg. Co., Rutherford, N. J.

EMPIRE Automobile Tire Co., Trenton, N. J.

PARKER, Stearns & Co., 228-229 South St., N. Y. City (see page 151).

TRENTON Rubber Mfg. Co., Trenton, N. J. (see page 151).

TOOLS

AUTMO Cabinet Co. (The), Rochester, N. Y.

BURNHAM, Geo. Co. (The), Worcester, Mass.

FRASSE Co. (The), 38 Cortlandt St., N. Y. City.

FRASSE, Peter A., & Co., 94 Fulton St., N. Y.

GOODELL-Pratt Co., Greenfield, Mass.

HAMMACHER, Schlemmer & Co., New York.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 77).

NORTON & Jones Machine Tool Works (The). East Main St., Plainville, Conn.

PATTERSON, Gottfried & Hunter, 146 Centre St., New York.

SMITH & Heminway, 296 Broadway, New York.

SPRINGFIELD Drop Forging Co., Springfield, Mass.

UNIVERSAL Tool Co., 54 Taylor St., Springfield, Mass.

UTICA Drop Forge & Tool Co., 296 Broadway, New York, N. Y.

VANDERBEEK Tool Wks., Hartford, Conn.

WATERBURY Tool Co., Waterbury, Conn.

TOOL BAGS

BOYLE & Co., John, 112-114 Duane St., N. Y. City.

GILBERT Mfg. Co., New Haven, Conn. (see page 149).

WARREN Leather Goods Co., 80 Austin St., Worcester, Mass.

TOP-CLOTH (See Rubber Cloth) also Trimmings (Cloth and Carpet)

TOPS (Auto)

AMERICAN Top Co., Jackson, Mich.

ANDERSON & Co., F. W., 1409 Montrose St., Philadelphia, Pa.

AUTO Top Co. (The), Fort Wayne, Ind. (see page opposite).

AUTOMOBILE Buggy Top Co. of America, Noxen, Pa.

AUTO Cape Top Co., 1465 Michigan Ave., Chicago, Ill.

AUTO Cover & Top Mfg. Co., 154 E. 57th St., N. Y. City.

AUTOMOBILE Parts & Equipment Co., 2228 Michigan Ave., Chicago, Ill. (see page 147).

AUTOMOBILE Top & Supply Co., Cleveland, O.

AUTOP & Tread Mfg. Co., Cleveland, O.

BALTIMORE Buggy Top Co., Baltimore, Md.

BARNDT-Johnston Auto Supply Co. (The), Columbus, O.

BAUER Bros., 937 W. 8th St., Cincinnati, O.

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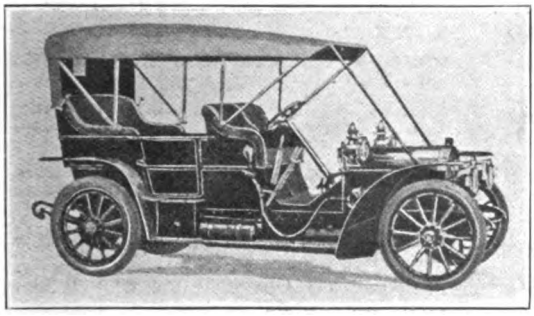

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BLUE Ribbon Horse & Carriage Co., 130-170 Cannon St., Bridgeport, Conn.

BRIGGS Carriage Co., Amesbury, Mass.

BROWN Auto Top Co., Philadelphia, Pa.

BUOB & Scheu, 408-412 Court St., Cincinnati, O.

CHICAGO Coach & Carriage Co., 1223 Michigan Ave., Chicago, Ill.

COLEMAN Auto Top Co., Detroit, Mich.

COLLINS & Son, G. A., Akron, O.

CRAMER, Wm. F. (The), Dayton, O.

CRAY Bros., 1244 Ninth St., N. W., Cleveland, O.

CRESCENT Auto Top Co., 58 W. 43d St., N. Y. City.

DETROIT Carriage Co., Detroit, Mich.

DETROIT Motor Car Supply Co., 1250 Jefferson Ave., Detroit, Mich.

DUANE & Co., W. J., New York City.

DUNHAM & Son, D. B., Rahway, N. J.

ECLIPSE Buggy Co., Fort Wayne, Ind. see page 159).

EMPIRE Gear & Top Co., 53 Mechanic St., Newark, N. J.

EMPIRE Gear & Top Co., 413 N. 22d St., Philadelphia, Pa.

EVERETT, B. F., Detroit, Mich.

FELLWOCK Roll & Panel Co. (The), Evansville, Ind.

FICKLING & Co., Inc., 154 E. 57th St., New York City.

FISHER, A., 302-310 Fort St., W., Detroit, Mich.

HALLIDAY, C. A., 42 Cedar St., Oneida, N. Y.

HARDWARE Specialty Mfg. Co., 724 W. 8th St., Anderson, Ind.

HILL Manufacturing Co., 25-27 Fuller St., Buffalo, N. Y.

INDIANAPOLIS Auto Top Co., 25 E. Ohio St., Indianapolis, Ind.

INDIANAPOLIS Buggy Top Co., 2116 So. Meridian St., Indianapolis, Ind.

INDIANAPOLIS Dash Co., Indianapolis, Ind.

KARBACH Automobile & Vehicle Co., Omaha, Neb.

KEYSTONE Wagon Works Co., Reading, Pa.

KIMBALL & Co., C. P., 315 Michigan Ave. Chicago, Ill. (see page 37).

KING Mfg. Co. (The), Springfield, O. (see page 37).

KNOWLTON, C. W., Hudson, Mass.

KRAMER & Co., Wm. F., Canal St., Dayton, Ohio.

KROH, C. Z., Mfg. Co., Toledo, O.

LARRIMORE Buggy Top Co., Baltimore, Md.

LIMOUSINE & Carriage Mfg. Co., 35th St. and Michigan Ave., Chicago, Ill.

LONDON Auto Supply Co. (The), 1235 Michigan Ave., Chicago, Ill. (see page 153).

LONGDIN-Brugger Co., Fond-du-lac, Wis.

LOUD, Fred A., Merrimac, Mass.

MANHATTAN Auto Top Co., 249 West 64th St., New York.

McCLELLAN, Chas. P., Fall River, Mass.

MECKEL, F. L., 77 E. 13th St., Chicago, Ill.

MEYER, C. G., Main and Ann Sts., Tiffin, O.

MICHIGAN Auto. Body Co., Detroit, Mich.

MICHIGAN Top Co., 17 Duffield St., Detroit, Mich.

MOUNT & Bros. J. W., Red Bank, N. J.

MURRAY & Co., P. A., Newton, Mass.

MYERS Auto Top Co. (The), Dayton, O. (see page 153).

NEUMEISTER, Fred P., Rockford, Ill.

NEWTON, W. H., & Son, 127 Elm St., Cortland, N. Y.

NEW York Carriage Top Co., 509 W. 30th St., N. Y. City.

NICHOLS & Co., D. P., 116-122 W. Brookline St., Boston, Mass.

O'NEILL-Ollier Co., 1532-34 Michigan Ave., Chicago, Ill.

PARSONS Buggy Top Co., Chicago, Ill.

PERFECTION Auto Top & Supply Co., 1253 Michigan Ave., Chicago, Ill.

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RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

RECKARD Auto Top Co., 938 N. Illinois St., Indianapolis, Ind.

RITTER Mfg. Co., 255 Jefferson Ave., Detroit, Mich.

ROBBINS & Co., Irwin, Indianapolis, Ind.

ROBERTSON & Doll, Denver, Colo.

RUSSELL, H. J., 32 Exchange St., Worcester, Mass.

SCHUBERT Bros. Gear Co., 42-44 Cedar St., Oneida, N. Y.

SHIELDS Carriage Co., Amesbury, Mass.

SNOW & Co., N. H., Binghamton, N. Y.

SPRAGUE Umbrella Co., Norwalk, O. (see page 43).

SPRINGFIELD Auto Top & Upholstering Co., 102 Dwight St., Springfield, Mass. (see page 153).

SPRINGFIELD Metal Body Co., 387 Birnie Ave., Brightwood, Mass. (see page 39).

STONE & Sons, C., 167 Ogden St., Chicago, Ill.

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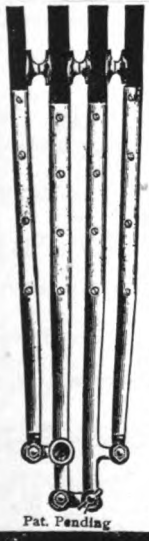

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WAUGH & Co., Chas., 856-864 Main St., Cambridge, Mass.

WEISS, Chas., 4725 Cottage Grove Ave., Chicago, Ill.

WOOD & Sons, Fred'k R., 219 W. 19th St., N. Y. City.

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COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 155).

DRUEN, B. D., 71 Hamilton St., New Haven, Conn.

HARPER Co., Walter J., 229-231 Mulberry St., Newark, N. J.

NON-CORROSIVE Metal Co., Inc., Watertown, Mass.

PARRY & Co., A. N., Amesbury, Mass.

SCHERER & Co., H., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

WING Co. (The) Charles, Amesbury, Mass.

TRIMMINGS (Cloth and Carpet)

ADAMS, Wm. F., 339 B'way, N. Y. City.

BRIDGEPORT Coach Lace Co., 805 Wood Ave., Bridgeport, Conn.

CARR, F. S., 74 Pearl St., Boston, Mass. (see page 159).

CRANDALL, Stone & Co., Binghamton, N. Y.

DUSENBURY, Louis, 86 Worth St., N. Y. City.

EVERETT, B. F., Detroit, Mich.

GERHAB, Jacob, 158-164 No. 3d St., Philadelphia, Pa.

HALLIDAY, C. A., 42 Cedar St., Oneida, N. Y.

HARDT, Von Bernuth & Co., 477 Broome St., N. Y. City.

HODGMAN Rubber Co., 806 Broadway, N. Y. City.

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MANUFACTURERS' Selling Co. (The), 1777 Broadway, N. Y. City.

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NEW Haven Button Co., New Haven, Conn.

PANTASOTE Co. (The), 11 Broadway, N. Y. City (see page opposite).

RARITAN Woolen Mills, 14 White St., N. Y. City.

ROEHM & Davison, Detroit, Mich.

ROUSE, J. G., & Co., 413 Arch St., Philadelphia, Pa.

ROY & Co., James, Watervleit, N. Y.

SCHOFIELD, Mason & Co., Fairhill and Cumberland Sts., Philadelphia, Pa.

SLATER, S., & Sons, 47 Worth St., N. Y. City.

TINGUE Mfg. Co., Seymour, Conn.

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AMERICAN Auto Brass Co. (The), 181 West Maple St., Columbus, O.

ANDERSON & Co., F. W., 1409-13 Montrose St., Philadelphia, Pa.

ATWOOD Mfg. Co., Amesbury, Mass.

AUTOMOBILE Parts & Equipment Co., 2228 Michigan Ave., Chicago, Ill. (see page 147).

BARLOW Mfg. Co., Holyoke, Mass.

CLARK Novelty Co. (The), 380 W. Exchange St., Rochester, N. Y.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 155).

COWLES, C., & Co., New Haven, Conn.

CRANDALL, Stone & Co., Binghamton, N. Y.

DOUGLAS & Lomason Co., 306 Grand River Ave., Detroit, Mich.

ENGLISH & Mersick Co. (The), 70-74 Crown St., New Haven, Conn.

FORT Wayne Brass Foundry Co., 44 Jefferson Ave., Detroit, Mich.

GLOBE Machine & Stamping Co. (The), Cleveland, O. (see page 99).

LEE Mfg. Co. (The), South Park, Port Huron, Mich.

METAL Stamping Co., 243 West St., N. Y. City.

MURDOCK, Jas., Jr., & Co., 116 Opera Pl., Cincinnati, O.

NEIDER Co., F. A. (The), Augusta, Ky. (see page 155).

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TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

VICTOR Metals Co., 29 Broadway, N. Y. City.

WOODRUFF & Sons Co., Walter W. (The), Mount Carmel, Conn.

TRUNKS (Auto)

A-Z Co. (The), 527 West 56th St., N. Y. City.

BOYLE & Co., John, 112-114 Duane St., N. Y. City.

MASON, John A., Newton, Mass.

SAGE'S Trunk Depot, Boston, Mass.

TEEL Mfg. Co., 132 Main St., Medford, Mass.

W. W. Winship, 71 Summer St., Boston, Mass.

TRUNK RACKS

CONNECTICUT Steel & Wire Co., 308 Pearl St., Hartford, Conn.

MASON, John A., Newton, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (see page 21).

TEEL Mfg. Co., 132 Main St., Medford, Mass.

TUBING (Brass and Copper)

AMERICAN Tube Wks., 137 Milk St., Boston, Mass.

ANSONIA Brass & Copper Co., Ansonia, Conn.

BENEDICT & Burnham, Waterbury, Conn.

BRIDGEPORT Brass Co., Bridgeport, Conn.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 123).

CHICAGO Brass Co., Kenosha, Wis.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

DETROIT Copper & Brass Rolling Mills, Detroit, Mich.

FRENCH Mfg. Co., Waterbury, Conn.

HOLMES, Booth & Hayden Co. (The), Waterbury, Conn.

IVINS, Elwood Tube Works, Oak Lane Station, Philadelphia, Pa.

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LONG-Turney Mfg. Co., Rome, N. Y.

NEW Jersey Tube Co., Newark, N. J.

RANDOLPH-Clowes Co., Waterbury, Conn.

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LAMINATED Tube Co., Columbus, O.

NATIONAL Tube Co., McKeesport, Pa.

PITTSBURG Seamless Tube Co., Beaver Falls, Pa.

SEAMLESS Tube Co. of America, Frick Bldg., Pittsburg, Pa.

SHELBY Steel Tube Co., 1819 Frick Bldg., Pittsburg Pa.

STANDARD Welding Co., 41 Cone St., Cleveland, O.

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LINK Belt Co., Chicago, Ill.

NORTH Penn. Iron Co. (The), Philadelphia, Pa.

PITLESS Turntable Co., Kansas City, Mo.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

WEBER Cycle & Supply Co., Colorado Springs, Colo.

UNIVERSAL JOINTS—See Joints (Flexible)

VALVES (Gasoline, Lock)

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 75).

VALVES (Safety)

AMERICAN Steam Gauge & Valve Mfg. Co., Jamaica Plains, Boston, Mass.

ARTIZAN Brass Co., 204 Lincoln Park Blvd., Chicago, Ill.

ASHTON Valve Co. (The), 271 Franklin St., Boston, Mass.

CROSBY Steam Gage & Valve Co., Boston, Mass.

LONERGAN & Co., J. E., Philadelphia, Pa.

LUNKENHEIMER Co., Cincinnati, O.

PITTSBURG Gage & Supply Co., 309 Water St., Pittsburg, Pa.

SCHAEFFER & Budenberg, Foxboro, Mass.

SIMMONS Co., John, N. Y. City.

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

STAR Brass Mfg. Co., Boston, Mass.

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

WESTERN Tube Co., Kewanee, Ill.

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BUCK, L. K., Freehold, N. J.

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HOLMES & Bros., Robt., Danville, Ill.

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SCHRADER'S, A., Sons, 30-32 Rose St., N. Y. City.

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SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

SIMMONS, John, Co., 104-110 Centre St., N. Y. City.

VINCENT Valve Co. (The), Sandusky, O.

VALVE LIFTERS

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BRENNAN Mfg. Co., Syracuse, N. Y.

ECKEL, Andrew, 1080 3d Ave., Brooklyn, N. Y.

JAMES, Wm., 92 Liberty St., N. Y. City.

PELTON Gaso. Eng. Wks., Lyons, Ia.

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BABCOCK Varnish Co., Boston, Mass.

BECKWITH, Chandler & Co., Newark, N. J.

BERRY Bros., Ltd., Detroit, Mich. (see front cover).

BILLINGS-Chapin Co., Cleveland, O.

BOSTON Varnish Co., Everett Sta., Boston, Mass.

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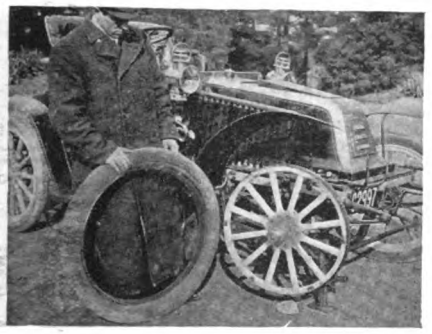

The Talk of the December Show

The value of detachable rims is unquestionable. They will be in universal use in the near future. The extra tire is carried, inflated, on a reserve rim. When the inevitable puncture comes, make the shift (two minutes) and take the old rim with the damaged tire home for repair at leisure.

The Perfection of Tire Service is obtained from Harburg-Wien Tires

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Covers the Field. *The Automobile*, which is published weekly at the Flatiron Building, New York, claims a position as the most responsible journal in the auto field, with the largest staff, the most branch offices and the best equipment. Its circulation for the year ending July 28 was 14,615 copies per week, according to a statement made to the Roll of Honor, and this far exceeds the known circulation of any other automobile journal. Of the issue of November 1, an edition of 15,500 copies were printed according to the regular statement published every week on the editorial page. *The Automobile* also claims to carry more advertising than any other similar publication going to the motoring public—purchasers and users of autos. Its record for the four issues of October is as follows:

	Cols.	Agate Lines.
October 4	222	30,492
" 11	222	30,484
" 18	201	27,612
" 25	216	29,666
Total		118,254

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COLUMBUS Varnish Co. (The), Columbus, Ohio.

DETROIT White Lead Works, 532 Milwaukee Ave., Detroit, Mich.

DEVOE, F. W., & C. T. Raynolds Co., Fulton and William Sts., N. Y. City.

DITZLER Paint & Color Co., 14 Baltimore Ave., West, Detroit, Mich.

FELTON, Sibley & Co., 136-140 No. 14th St., Philadelphia, Pa.

FLOOD & Conklin Co., 136 Chestnut St., Newark, N. J.

GILLESPIE, Chas. H., & Sons, 125 Dey St., Jersey City, N. J.

GLIDDEN Varnish Co., Williamson Bldg., Cleveland, O.

HILDRETH Varnish Co., 32 B'way, N. Y. City.

LUCAS & Co., John, Philadelphia, Pa.

MASURY, John W., & Son, 44-50 Jay St., Brooklyn, N. Y.

MINETT Varnish Co., 129 Pearl St., N. Y. City.

MURPHY Varnish Co., Chestnut and McWhorter Sts., Newark, N. J.

NICE, Eugene E., 272-74 S. 2d St., Philadelphia, Pa.

ORIENTAL Varnish Co., 72 Midwood St., Brooklyn, N. Y.

PARROTT Varnish Co., Bridgeport, Conn.

PAYSON Varnish Co., 141st St. and Walnut Ave., New York City.

PERRIN Varnish Co., 1133 Broadway, N. Y.

RUBBER Paint Co., 154-156 W. Van Buren St., Chicago, Ill.

SCHRACK, C. & Co., 152 No. 4th St., Phila., Pa.

SHERWIN-Williams Co., Cleveland, O.

SMITH, Edward, & Co., 45 B'way, N. Y.

STANDARD Varnish Works, 29 Broadway, New York (see page opposite).

VALENTINE & Co., 257 Broadway, N. Y. City.

WATTS De Golyer Co. (The), 377 Illinois St., Chicago, Ill.

WESTERN Reserve Varnish Co., Marquette St., Cleveland, O.

WILLEY, C. A., Hunter's Point, New York.

VISES

EMMERT Mfg. Co., Waynesboro, Pa.

PITTSBURG Automatic Vise & Tool Co., 1305 McChesney Bldg., Pittsburg, Pa.

VOLTMETERS (See Ammeters and Voltmeters)

VULCANIZERS

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (see page 79).

AUTO Improvement Co., 316 Hudson St., New York City.

AUTO-TIRE Vulcanizing Co., Lowell, Mass.

CAIN, Frank, 202 4th Ave., Detroit, Mich.

CORP Bros., 40 Mathewson St., Providence, R. I.

FISK Rubber Co., Chicopee Falls, Mass.

INVINCIBLE Mfg. Co., Wilmington, Ill.

MAXSOM Vulcanizing Works, 115 Main St., W. Rochester, N. Y.

NATIONAL Cement & Rubber Mfg. Co., 3053-59 Monroe St., Toledo, O.

RICE, Louis E., Cedar Falls, Ia.

SHALER Co., C. A., Waupun, Wis.

STITCH in Time Vulcanizer Co., 831 Kansas Ave., Topeka, Kans.

WASHERS

ARMSTRONG Cork Co., 23d St., and A. V. Ry., Pittsburg.

BOWEN Mfg. Co., Auburn, N. Y.

CLARK, A. N., & Son, Painville, Conn.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 99).

HOFFELD, R., & Co., 61-63 Carroll St., Buffalo, N. Y.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

MERRIAM, Wm. N., Taunton, Mass.

NATIONAL Lock Washer Co. (The), 65-79 Johnson St., Newark, N. J. (see page 177).

PICROME Hide Co., 1417 N. Salina St., Syracuse, N. Y.

POSITIVE Lock Washer Co., Newark, N. J. (see page 177).

SCHOONMAKER, A. O., 221 Fulton St., N. Y.

STIMPSON, E. B., & Son., 31 Spruce St., N. Y.

UPSON Bolt & Nut Co., Cleveland, O.

WOLVERINE Leather Goods Co., 59 E. Fort St., Detroit, Mich.

WASHERS (Felt)

BOOTH, N. E., 743-45 39th St., Brooklyn, N. Y. (see page 177).

BOWEN Mfg. Co., Auburn, N. Y.

BRAUNSDORF, Geo. W., 309 E. 43d St., N. Y. City.

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during the last five years has been won by S. V. W. (Standard "Body" and Standard "Gear"). We've also annexed all the blue ribbons for working facility and brilliancy of finish.

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are unequaled by any other line in the World. They embody all the Varnish virtues and combine working and flowing freedom, with brilliancy and durability.

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CONN. Supply Co., Hartford Life Ins. Bldg., Hartford, Conn.

IDEAL Carriage Washer Co., 62 Lenox St., Rochester, N. Y.

NICHOLSON Mfg. Co., H., 68 Dey St., N. Y.

RYAN & Long, 586 Oneida St., Appleton, Wis.

VEHICLE Specialty Co., 32 Union Pl., Hartford, Conn. (see page 179).

WATER ALARMS AND COLUMNS

JARVIS Engine & Machine Works, River and Spring Sts., Lansing, Mich.

KITTS Mfg. Co., 111-115 Water St. Oswego, N. Y.

LOCKE Regulator Co., Salem, Mass.

PITTSBURG Gauge & Supply Co., 309 Water St., Pittsburg, Pa.

RELIABLE Water Gauge Co., 1616 Pine St., St. Louis, Mo.

RELIANCE Gauge Column Co. (The), 45 E. Prospect St., Cleveland, O.

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

WATER COLUMN MIRRORS

ATWOOD Mfg. Co., Amesbury, Mass.

KNOX, The Frank J. Co., Hartford, Conn.

WELDING (Electric)

STANDARD Welding Co., Cleveland, O.

WHEELS (Comb'n Wood and Wire)

ESTY, Wm., Laconia, N. H.

LEE & Porter, Buchanan, Mich.

TOOMEY, C., & Co., 915 Campbell St., Kansas City, Mo.

WHEELS (Sheet Steel)

TURNER & Fish Co., 19 Quincy St., Chicago, Ill. (see page 169).

WHEELS (Tubular Steel)

BRYANT Steel Rim & Wheel Co., Columbus, Ohio.

MIDGLEY Mfg. Co., Hacking St. and Dublin Ave., Columbus, Ohio.

PARISH & Bingham Co., Cleveland, O.

WHITESIDE Wheel Co., 311 E. South St., Indianapolis, Ind.

WHEELS (Wire)

GARFORD Co. (The), Elyria, O.

JAMESVILLE Mfg. Co., Jamesville, N. Y.

PRUDDEN, W. K., & Co., Lansing, Mich.

RASTETTER, Louis & Son, Fort Wayne, Ind.

SMITH Co., A. O., Milwaukee, Wis.

WESTON-Mott Co., Flint, Mich., and Utica, N. Y.

WHEELS (Wood)

AMERICAN Roller Bearing Co., South Framington, Mass.

ARCHIBALD Wheel Co., Lawrence, Mass.

BIDDLE & Smart Co., Amesbury, Mass.

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 189).

BUCKEYE Wheel Co., Galion, O.

CARR, Prescott & Co., Amesbury, Mass.

CITY Machine Co., 9 Orchard St., Detroit, Mich.

CRANE & McMahon, 18 South St., N. Y.

EAMES, A. M., & Co., So. Framingham, Mass.

FEDERAL Automobile Co., 1334 First National Bk. Bldg., Chicago, Ill.

FITCHBURG Wheel Co., Fitchburg, Mass.

HOOPES Bros. & Darlington, West Chester, Pa.

IMPERIAL Wheel Co., Flint, Mich. (see page opposite).

JAMESVILLE Mfg. Co., Jamesville, N. Y.

JONES, Phineas & Co., 301 Market St., Newark, N. J. (see page 189).

JONES, John E., 173 South St., Utica, N. Y.

MADISON Wheel Co., Madison, O.

NATIONAL Wheel Co., Jackson, Mich.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 127).

NEW Haven Carriage Co., New Haven, Conn.

OLDS Wagon Wks., Fort Wayne, Ind.

PRUDDEN, W. K., & Co., Lansing, Mich.

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y. (see page opposite).

SCHWARZ Wheel Co., Philadelphia, Pa.

SELLE Gear Co. (The), Akron, O.

SENDELBACH Wheel Co., E. St. Louis, Ill.

SHORTSVILLE Wheel Co., Shortsville, N. Y.

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Notable for

Elegance, Finish, Style, Strength.

This Cut Shows Our No. 18.

In our heavier wheels we lose none of the artistic, still retaining sufficient strength in all parts. The mechanical value of our Patent Improved Artillery Hub stands out strong, for the ribs DO stiffen the flanges, DO prevent torsion, DO keep bolts from shearing, DO keep spokes always in alignment—facts that cannot be said of the smooth flange Hub.

Write for full particulars and prices.

Salisbury Wheel & Mfg. Co., Jamestown, N. Y.

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NOT CHEAPEST—BUT BEST

IMPERIAL WHEEL COMPANY

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American Trust Building, Cleveland, O.
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STANDARD Wheel Co., Terre Haute, Ind.

STINSON, Edward, & Co., 327-335 North St., Baltimore, Md.

TIMKEN Roller Bearing Axle Co., Canton, O.

WAPAKONETA Wheel Co., Wapakoneta, O.

WESTON-Mott Co., Flint, Mich., and Utica, N. Y.

WHEEL & Wood Bending Co. (The), 141 John St., Bridgeport, Conn.

ZWICK & Greenwald Wheel Co. (The), Dayton, O.

WHEEL TRUERS

DUDLEY, A. Mfg. Co., Menominee, Mich.

GARVIN Mach. Co., Spring and Varick Sts., N. Y. City.

WAGNER Cycle Co., 41-43 West 4th St., St. Paul, Minn.

WIND SHIELDS (Glass)

AUTOMOBILE Parts and Equipment Co., 2228 Michigan Ave., Chicago, Ill. (see page 147).

BLASIER Mfg. Co., M. E., Utica, N. Y.

CARTIER, Chapman & Co., Ludington, Mich.

DUANE & Co., W. J., New York.

LIMOUSINE Carriage Mfg. Co., Chicago, Ill.

LONDON Auto Supply Co., 1235 Michigan Ave., Chicago, Ill. (see page 153).

MANHATTAN Auto Top Co., 249 W. 64th St., N. Y. City.

O'NEILL-Ollier Co., 1532-34 Michigan Ave., Chicago, Ill.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 49).

SPRAGUE Umbrella Co., Norwalk, O. (see page 43).

STUDEBAKER Bros. Mfg. Co., South Bend, Ind.

WIRE (Insulated)

AMERICAN Electrical Works, Providence, R. I.

AMERICAN Steel & Wire Co., The Rookery, Chicago, Ill.

ATLANTIC Insulated Wire & Cable Co., New York.

BOURN Rubber Co., Providence, R. I.

CHICAGO Insulated Wire Co., 152 Lake St., Chicago, Ill.

CLARK Insulation Co. (The), 186 Freeport St., Boston, Mass.

EASTERN Electric Cable Co., 61-63 Hampshire St., Boston, Mass.

GENERAL Electric Co., Schenectady, N. Y.

HAZARD Mfg. Co., Wilkesbarre, Pa.

INDIA Rubber & Gutta Percha Insulating Co., N. Y. City.

INDIANA Rubber and Insulated Wire Co., Jonesboro, Ind.

MILLER, Norman Bruce, 1420 Chesnut St., Phila., Pa.

NATIONAL India Rubber Co., Bristol, R. I.

NEW YORK Insulated Wire Co., 114 Liberty St., N. Y. City.

OKONITE Co., 253 Broadway, N. Y. City.

PACKARD Electric Co., 412 North Ave., Warren, O.

RUBAY, Leon, 136 W. 38th St., N. Y. City. (Importer).

SAFETY Insulated Wire & Cable Co., N. Y.

SIMPLEX Electrical Co., Boston, Mass.

STANDARD Underground Cable Co., Pittsburg, Pa.

WIRE TERMINALS

AMERICAN Electric Novelty & Mfg. Co., N. Y. City.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

B. & B. Co., 97 Rockview Ave., Plainfield, N. J.

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BLISS-Chester Co., Providence, R. I.

BRIGGS, W. H., 424 Bedford Ave., Brooklyn, N. Y.

EASTERN Carbon Works, Jersey City, N. J.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FAHNESTOCK Electric Co., 132 Havemeyer St., Brooklyn, N. Y.

FRANCO-AMERICAN Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

HERZ & Co., 203-205 Lafayette St., N. Y. City.

MOHAWK Electric Co., 1554 Union St., Schenectady, N. Y.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

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"INDESTRUCTIBLE" STEEL WHEELS

are superior to any wood or steel wheel because they

Never Can Collapse
Never Swell or Shrink
Forever Perpetually Round
No Open Spaces
Enameled NOT Painted
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Therefore

Safe
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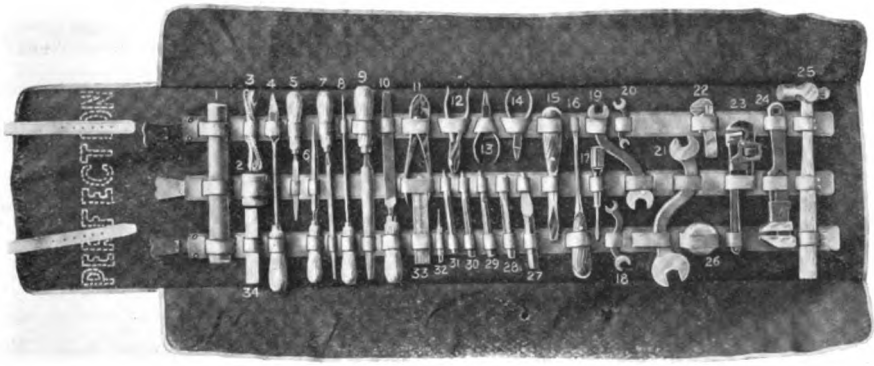

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Immediate Shipments — Special Kits to Order.

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NEVER-Miss Spark Plug Co., Lansing, Mich.

NEWPORT Eng. Works, 367 Thames St., Newport, R. I.

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 41).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

RAJAH Auto. Supply Co., 140 Washington St., N. Y. City.

SHAIN, Chas. D., 70 Murray St., N. Y. City.

SPLITDORF, C. F., 27 Vandewater St., N. Y. City (see page 109).

WOOD BENDINGS

AMERICAN Veneer Co., 666 Market St., Kenilorth, N. J. (see page 17).

SHEPHERD & Son, H. G., New Haven, Conn.

TUCKER Wood Work Co. (The), Sidney, O.

WRENCHES

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 79).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 155).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 23).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 11).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 117).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 27).

BILLINGS & Spencer Co., Russ and Lawrence Sts., Hartford, Conn.

BULLARD Automatic Wrench Co., Providence, R. I.

COES Wrench Co., Worcester, Mass.

DETROIT Wrench Co., Tolsma Bldg., 45 State St., Detroit, Mich.

DUDLY, A., Mfg. Co., Menominee, Mich.

EDMONDS-Metzel Mfg. Co., 153-159 S. Jefferson St., Chicago, Ill.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 69).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 143).

HALL'S Sons, Samuel, New York, N. Y.

HAWKEYE Wrench Co., Marshalltown, Ia.

HJORTH Wrench Co., Jamestown, N. Y.

IRLAND Pipe Wrench Co., 15 Court Sq., Boston, Mass.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 75).

JENNINGS & Co., C. E., New York, N. Y.

KIBELE & Co., 187 Wisconsin St., Milwaukee, Wis.

LAMSON & Sessions, 412 Scranton Road, Cleveland, O.

MASON Tool & Wrench Mfg. Co., First National Bk. Bldg., Chicago, Ill.

MILLER Combination Tool Co., Syracuse, N. Y. (see page 119).

MOSSBERG, Frank, Co., Attleboro, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 21).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 127).

OFFSET Handle Wrench Co., 123 Lasalle St., Chicago, Ill.

ORR & Lockett Hardware Co., 71 Randolph St., Chicago, Ill.

PECK, Stow & Wilcox Co., Southington, Conn.

PEDERSEN Mfg. Co., 644 First Ave., N. Y. City.

POPE Mfg. Co., Hartford, Conn. (Dealern and Jobbers) (see page 91).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 81).

QUINCY, Manchester, Sargent Co., 293 Dearborn St., Chicago, Ill. (see page 173).

ROTHENBUCHER Mfg. Co., 328 Jerome St., Brooklyn, N. Y.

SMITH & Hemmingway, 296 Broadway, New York.

SPRINGFIELD Drop Forging Co., Springfield, Mass.

SYRACUSE Wrench Co., Franklin and Water Sts., Syracuse, N. Y. (see page opposite).

TOWER & Lyon, New York, N. Y.

TRIMONT Mfg. Co., Roxbury, Mass.

TUDOR Mfg. Co., 147 Mill St., Boston, Mass.

WAKEFIELD, J. E., 89 Exchange St., Worcester, Mass.

WALWORTH Mfg. Co., Boston, Mass.

WHITMAN & Barnes Co., Akron, O.

WILLIAMS & Co., J. H., Brooklyn, N. Y.

WORCESTER Pressed Steel Co., 100 Beacon St., Worcester, Mass.

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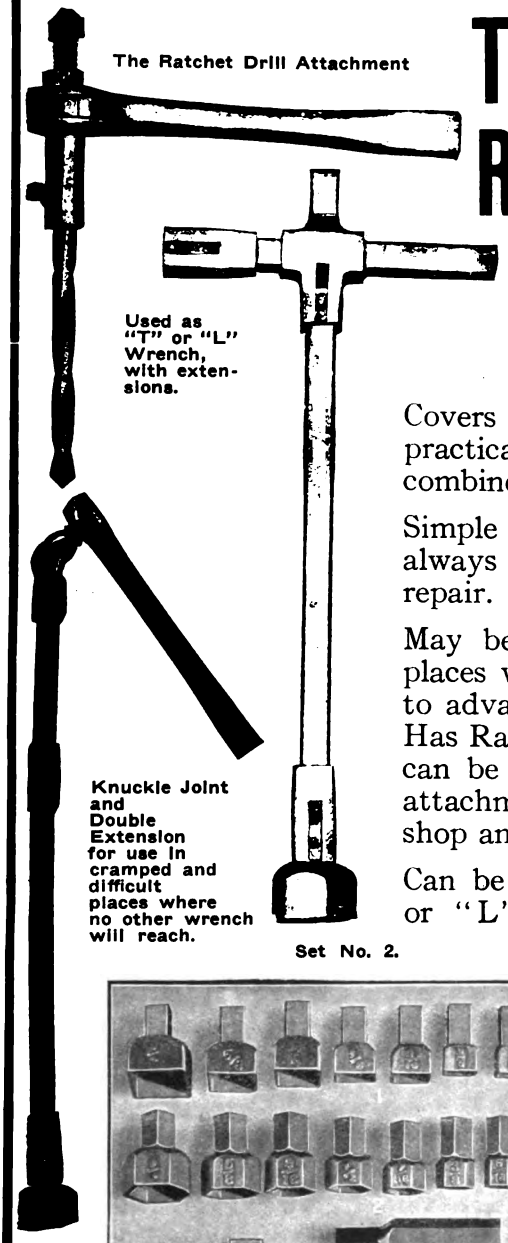


The CHAMPION Ratchet Wrench

The Most Useful Tool Ever Offered to Automobilists

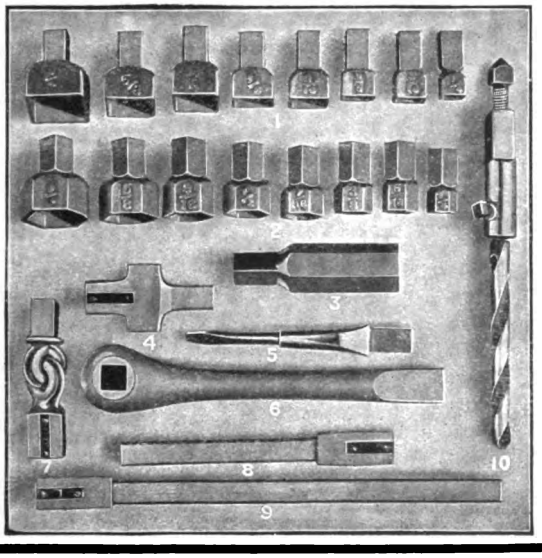
Covers the whole wrench field with a practical Ratchet Drill Attachment combined.

Simple and strong in construction—always ready and never gets out of repair.

May be used in cramped and close places where you are unable to work to advantage with any other wrench. Has Ratchet and Drill Attachment so can be used as drill in emergency; an attachment of special advantage to shop and repair men.

Can be used with extensions as "T" or "L" wrench; knuckle joint and double extension for cramped places no other wrench can go.

Set No. 2.



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Big Money for dealers who write quick.

WRITE US.

THE SYRACUSE WRENCH CO.

FRANKLIN AND WATER STS.
SYRACUSE, N.Y.

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TABLES AND DATA FOR ENGINEERS

Reference Tables for Indicated Horsepower

It is often convenient to have a ready reference table, by the aid of which an immediate approximation to the horsepower of a motor can be made when the bore and stroke are known. Such a table has been prepared by Worby Beaumont, the well-known English engineer, who gave permission to the editor of *The Automobile Club Journal* in London to publish it. One table gives the ratings of engines with the cylinder dimensions in inches and fractions, and the other table gives the results with cylinders built to metric measurements. Of course, in a table of this sort, an arbitrary set of conditions as to revolutions, mean effective pressure and mechanical efficiency have to be assumed; those employed represent average practice and the table is not offered as a substitute for experimentation when the most accurate results are desired.

It will be noted from Table I that in a very small space the estimated indicated power of engines with bore and stroke dimensions varying from 2-in. bore and 2-in. stroke to 6-in. bore and 6 1-2-in. stroke is given. Similarly, in Table II, a similar series is given in metric measurement, covering sizes from 70 mm. bore and 70 mm. stroke to 150 mm. bore and 165 mm. stroke. In Table I there is a quarter of an inch difference of size of bore and stroke measurements between any two powers given, and in Table II a difference of 5 mm. In explanation of the tables, it will be seen that in column 1 the bore or cylinder diameter of the engine may be found, and in the columns to the right of this, commencing with the column headed 0, the power of the engine having that cylinder diameter and a stroke of the same dimension. Columns 3 to 10 in each table give the powers of engines of, for instance, the same bore, but having a stroke greater than the bore by the amount stated at the top of the column. For example, referring to Table I, an engine having a cylinder 4 inches in diameter and a stroke of 4 inches would develop, under conditions to be stated, 4.27 i.h.p., as shown in the column headed 0; that is, column 2. If, however, the engine has a cylinder bore of 4 inches and a stroke of 5 1-2 inches, then the power developed is as shown in column 8, 5.89 i.h.p.

Similarly, for example, referring to Table II, an engine having a bore and stroke of 100 mm. would give 4.09 i.h.p., and an engine with a cylinder 100 mm. diameter and 140 mm. stroke would give 5.72 i.h.p.

It will be observed that to each bore dimension in column 1, two horizontal lines are given. The first of these gives the calculated power at a speed of 750 revolutions per minute, and the second the power at 1,000 revolutions per minute. The figures for the higher speed are printed in italic type.

The powers given in the tables represent the calculated indicated power given by one cylinder, and when multi-cylinder engines are being considered, the power shown by the table must be multiplied by the number of cylinders to give the total power.

To determine the useful power or brake horsepower, the mechanical efficiency of the engine has to be considered. No general rule can be given for this, and it may vary from a little less than 80 per cent. of the indicated power to as much as 88 per cent. For the majority of four-cylinder engines of good design and in good condition, run at speeds not unsuited to their design, and for powers of not less than 20 b.h.p., the efficiency may be considered to be 85 per cent. within reasonably close limits of accuracy This figure is, however, merely suggestive, and it is necessary to be familiar with engine design and performances to correctly estimate the brake horsepower from the estimated indicated power of these small high-speed engines.

Very frequently an approximation to the calculated indicated power, or power developed in the cylinders, is all that is required to be known, and this may be taken direct from the tables, for the two named speeds; *i.e.*, 750 or 1,000 revolutions per minute. For other speeds the difference may be taken as arithmetically proportionate through a limited range, according to the type and design of the engine.

Tables on page 174

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20 Miles From Nowhere

Don't make any difference in an Automobile breakdown if you are equipped with an

Auto-Cle

AUTOMOBILE WRENCH

It will *fit and turn* any adjusting nut or bolt on any automobile.

Is a *ratchet wrench*, working in *either* direction in the *smallest spaces*.

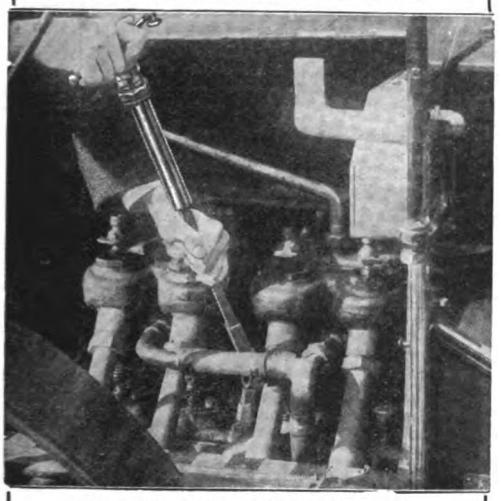
Can be used without ratchet movement.

Has a *universal joint* permitting use at *any angle*.

Great leverage—simple—strong. Will not get out of order.

Very compact—furnished in neat leather or wooden cases.

Extra large set for the repair shop.



The Q. & C. STANWOOD AUTOMOBILE STEP

is made of thin strips of *Bessemer Steel* bent so as to form *corrugations* across the step and fastened so as to make movement impossible. Absolutely *non-slipping*.

Can be easily attached to any automobile. It is handsome in appearance. Serves also as a foot scraper.

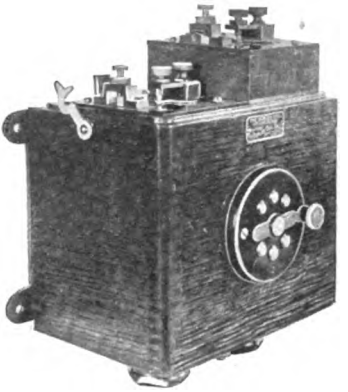
An Auto without *Stanwood Steps* is *not* the best—Specify them on your machines.

Write us for further information and Catalog "L."

Quincy, Manchester, Sargent Co

Old Colony Bldg., Chicago, Ill

The Why of the Duplex Coil



Two cores instead of one means short primary and secondary windings—no loss of energy in the coils—the full voltage being delivered to the vibrator.

They mean 4-times-greater magnetic force—the use of a strong spring and light armature, a quick, hot spark at the point of compression, which produces ***full force*** and ***power***.

"A mile's trial will prove it all." Therefore we make the following offer to you to-day. Don't doubt.

Just write.

30 Days' Free Trial

We will send the Duplex Coil, express prepaid, to any manufacturer or responsible automobile owner on its merits. Put this coil on any car in place of any other coil on the market, and if, after a reasonable trial, the Duplex Coil does not show greater efficiency, does not give a hotter spark, does not increase the power of your car, does not use less current for a given mileage, and is not more generally satisfactory than any coil on the market, remove it from the car and return it to us at our expense, and the test will have cost you nothing.

If the coil bears out our claims after a most rigorous trial, then pay us the small sum which we ask.

Write us to-day on your business stationery, and a Duplex Coil will be sent you at once.

THE DUPLEX COIL CO.

Station L, Fond du Lac Wisconsin

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Horsepower Table I.– Cylinder Dimensions in Inches and Fractions.

Bore	0	¼	½	¾	1	¼	½	¾	2
2	0.54	0.60	0.67	0.74	0.81	0.88	0.94	1.01	1.08
	0.72	*0.80*	*0.89*	*0.98*	*1.08*	*1.17*	*1.25*	*1.35*	*1.44*
2¼	0.76	0.84	0.92	1.01	1.09	1.18	1.26	1.35	1.43
	1.01	*1.12*	*1.22*	*1.34*	*1.45*	*1.57*	*1.68*	*1.81*	*1.90*
2½	1.04	1.15	1.25	1.35	1.46	1.56	1.67	1.77	1.88
	1.39	*1.53*	*1.67*	*1.81*	*1.95*	*2.09*	*2.23*	*2.37*	*2.51*
2¾	1.39	1.51	1.64	1.77	1.89	2.02	2.14	2.27	2.40
	1.85	*2.02*	*2.19*	*2.36*	*2.53*	*2.70*	*2.87*	*3.04*	*3.20*
3	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	3.00
	2.40	*2.60*	*2.80*	*3.00*	*3.21*	*3.40*	*3.61*	*3.81*	*4.00*
3¼	2.30	2.47	2.65	2.82	3.00	3.18	3.36	3.53	3.70
	3.06	*3.28*	*3.52*	*3.76*	*3.99*	*4.22*	*4.45*	*4.70*	*4.92*
3½	2.86	3.06	3.27	3.48	3.68	3.88	4.09	4.30	4.50
	3.81	*4.09*	*4.36*	*4.63*	*4.90*	*5.18*	*5.45*	*5.72*	*6.00*
3¾	3.53	3.76	4.00	4.35	4.47	4.71	4.95	5.18	5.41
	4.71	*5.02*	*5.34*	*5.65*	*5.97*	*6.28*	*6.60*	*6.91*	*7.23*
4	4.27	4.65	4.81	5.08	5.35	5.61	5.89	6.15	6.41
	5.71	*6.06*	*6.42*	*6.78*	*7.13*	*7.50*	*7.85*	*8.20*	*8.55*
4¼	5.13	5.44	5.74	6.04	6.34	6.64	6.95	7.25	7.55
	6.84	*7.24*	*7.64*	*8.05*	*8.45*	*8.85*	*9.25*	*9.66*	*10.06*
4½	6.19	6.53	6.87	7.22	7.56	7.90	8.25	8.59	8.93
	8.25	*8.68*	*9.16*	*9.62*	*10.08*	*10.54*	*10.96*	*11.41*	*11.89*
4¾	7.18	7.55	7.94	8.31	8.70	9.07	9.45	9.82	.....
	9.57	*10.07*	*10.57*	*11.09*	*11.58*	*12.08*	*12.59*	*13.09*	.....
5	8.38	8.80	9.22	9.65	10.05	10.46	10.90	.....	.....
	11.16	*11.72*	*12.28*	*12.84*	*13.40*	*13.95*	*14.50*	.....	.....
5¼	9.70	10.16	10.62	11.09	11.54	12.00	.....	.....	.....
	12.92	*13.54*	*14.15*	*14.76*	*15.40*	*16.00*	.....	.....	.....
5½	11.12	11.65	12.15	12.66	13.15	.....	.....	.....	.....
	14.84	*15.51*	*16.20*	*16.86*	*17.54*	.....	.....	.....	.....
5¾	12.71	13.27	13.82	14.38	.....	.....	.....	.....	.....
	16.96	*17.70*	*18.42*	*19.19*	.....	.....	.....	.....	.....
6	14.45	15.05	15.65	.....	.....	.....	.....	.....	.....
	19.25	*20.05*	*20.85*	.....	.....	.....	.....	.....	.....

Horsepower Table II.—Cylinder Dimensions in Millimeters (Metric System).

Bore	0	5	10	15	20	25	30	35	40
70	1.40	1.50	1.59	1.69	1.80	1.89	1.99	2.10	2.20
	1.87	*2.00*	*2.13*	*2.26*	*2.40*	*2.53*	*2.66*	*2.80*	*2.94*
75	1.72	1.84	1.95	2.07	2.18	2.29	2.41	2.53	2.64
	2.30	*2.45*	*2.60*	*2.76*	*2.91*	*3.06*	*3.22*	*3.37*	*3.52*
80	2.09	2.23	2.35	2.49	2.62	2.76	2.88	3.02	3.14
	2.79	*2.97*	*3.14*	*3.32*	*3.49*	*3.67*	*3.84*	*4.02*	*4.19*
85	2.43	2.65	2.80	2.95	3.09	3.24	3.39	3.54	3.69
	3.34	*3.54*	*3.73*	*3.93*	*4.12*	*4.32*	*4.52*	*4.72*	*4.91*
90	2.97	3.14	3.30	3.46	3.64	3.80	3.96	4.13	4.30
	3.96	*4.18*	*4.40*	*4.62*	*4.85*	*5.06*	*5.28*	*5.50*	*5.72*
95	3.50	3.68	3.87	4.05	4.24	4.42	4.61	4.80	4.98
	4.67	*4.91*	*5.16*	*5.40*	*5.65*	*5.90*	*6.15*	*6.40*	*6.64*
100	4.09	4.29	4.49	4.70	4.90	5.11	5.30	5.51	5.72
	5.45	*5.71*	*5.99*	*6.26*	*6.53*	*6.81*	*7.07*	*7.35*	*7.62*
105	4.73	4.95	5.17	5.40	5.63	5.85	6.08	6.30	6.53
	6.30	*6.60*	*6.90*	*7.20*	*7.50*	*7.80*	*8.10*	*8.40*	*8.70*
110	5.43	5.69	5.93	6.19	6.44	6.68	6.96	7.16	7.42
	7.23	*7.58*	*7.90*	*8.25*	*8.57*	*8.90*	*9.23*	*9.55*	*9.90*
115	6.22	6.48	6.77	7.03	7.30	7.56	7.85	8.11	8.37
	8.30	*8.65*	*9.02*	*9.38*	*9.74*	*10.01*	*10.46*	*10.81*	*11.18*
120	7.07	7.37	7.66	7.96	8.25	8.53	8.84	9.13	9.41
	9.42	*9.82*	*10.21*	*10.61*	*11.00*	*11.39*	*11.79*	*12.18*	*12.57*
125	7.97	8.30	8.63	8.94	9.25	9.57	9.89	10.21	10.54
	10.64	*11.06*	*11.50*	*11.91*	*12.34*	*12.76*	*13.20*	*13.61*	*14.04*
130	8.95	9.30	9.65	9.99	10.34	10.70	11.01	11.38	.....
	11.94	*12.40*	*12.86*	*13.31*	*13.79*	*14.25*	*14.70*	*15.16*	.....
135	10.08	10.44	10.80	11.18	11.56	11.92	12.30	.....	.....
	13.41	*13.91*	*14.40*	*14.90*	*15.41*	*15.90*	*16.40*	.....	.....
140	11.22	11.65	12.04	12.44	12.84	13.25	.....	.....	.....
	14.99	*15.51*	*16.05*	*16.60*	*17.12*	*17.68*	.....	.....	.....
145	12.52	12.98	13.41	13.82	14.25	.....	.....	.....	.....
	16.70	*17.30*	*17.88*	*18.42*	*19.00*	.....	.....	.....	.....
150	13.81	14.26	14.72	15.40	.....	.....	.....	.....	.....
	18.41	*19.01*	*19.64*	*20.23*	.....	.....	.....	.....	.....

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FERRO CYLINDERS

MARINE ENGINES

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FERRO Cylinders and all Engine Castings are made by the "AIR FURNACE METHOD"

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Table of Gradients

GRADE		Equal to Angle of	Rise or Fall in One Mile, Feet
Per Cent	Units		
20	1 in 5	11° 19′	1,056
17	1 " 6	9° 26′	880
14	1 " 7	8° 09′	754
12.5	1 " 8	7° 08′	635
11	1 " 9	6° 17′	586
10	1 " 10	5° 43′	528
9	1 " 11	5° 11′	480
8	1 " 12	4° 46′	440
7.75	1 " 13	4° 24′	406
7	1 " 14	4° 05′	337
6.5	1 " 15	3° 49′	352
6.25	1 " 16	3° 35′	330
6	1 " 17	3° 22′	310
5.5	1 " 18	3° 11′	293
5	1 " 19	3° 00′	277
5	1 " 20	2° 52′	204
4	1 " 25	2° 18′	218
3.3	1 " 30	1° 55′	155
2.8	1 " 35	1° 38′	151
2.5	1 " 40	1° 26′	132

Hill-Climbing Formulas (Worby Beaumont)

W = Weight of car and load in pounds.
w = Weight of car and load in tons.
H = Total ascent in feet.
L = Length of hill in feet.
R = Road resistance in pounds per ton weight of car and load.
r = Air resistance in pounds = $V^2 A$ 0.0017.
V = Velocity of car in feet per second.
A = Area of car in square feet presented to air resistance.
T = Time occupied in ascent in seconds.
E = Efficiency of transmission of power from engine to road wheels
$H.P.$ = Effective horse power of engine.
p = Power given off at road wheels or work done in ascending hill.
S = Speed of ascent in miles per hour.

Then if P = Mean effective cylinder pressure
L = Length of stroke in feet.
A = Area of piston in square inches.
N = Number of useful or firing strokes per minute,

the brake horse-power of petrol or steam engines, having a mechanical efficiency of E, is

$$\frac{EPLAN}{33000}$$

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Plain Bevel Pattern

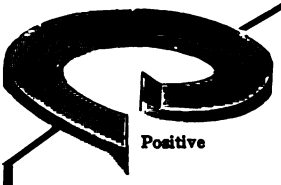
National Lock Washer

Furnished in all sizes for locking and holding nuts tight on bolts on all parts of automobiles. This method of securing the nuts GUARANTEED SUPERIOR to any other.

Samples furnished free for test

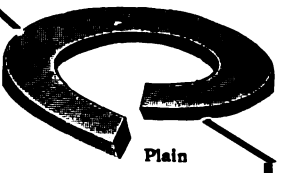
The NATIONAL LOCK WASHER CO.

65-79 Johnson Street, NEWARK, N. J.



Positive

The POSITIVE Lock Washer



Plain

Made in all sizes and weights for Automobile purposes. Can be used thinner than any other lock washer — effective no matter how thin. One lock under the nut and head can be used if so desired. Exhaustive tests, covering a period of nearly 12 years on railroad track, drop presses, Automobiles and machinery subject to vibration, have proven its superiority over every nut lock manufactured. *Write for samples and price.*

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For compound steam engines the number of useful working strokes are those occurring in the low-pressure cylinder, and the mean effective pressure in the high-pressure cylinder or cylinders is referred to the area of the low-pressure cylinder.

The power given off at the road wheels during the ascent of the hill is

$$p = \frac{HW + (R\,w + r)\,L}{T\ 550}$$

and the brake horsepower required at the engine with a selected value of E is

$$HP = \frac{HW + (R\,w + r)\,L}{TE\ 550}$$

With the other conditions known, the efficiency may be found from

$$E = \frac{HW + (R\,w + r)\,L}{HP.\ T\ 550}$$

the speed of the ascent in miles per hour from

$$S = \frac{L}{\dfrac{HWL + (R\,w + r)}{HP.\ E\ 550}\,L} \times 1\ 466$$

and the time occupied in the ascent from

$$T = \frac{HW + (R\,w + r)\,L}{HP.\ E\ 550}$$

Unless the probable speed of the car is high, or the wind velocity such that the pressure upon the surface of the car presented to air resistance opposing motion approaches that due to the speed of the car through still air, then the quantity r may be omitted from the foregoing expressions without introducing more than slight error.

Speed Formula

To reduce A miles in B seconds to miles per hour,

$$A \times \frac{3600}{B} = \text{miles per hour.}$$

Speed Equivalents in American and French Measurements

1 mile per hour	=	88	ft. per minute.
	=	1.46	ft. per second.
	=	27.8	metres per minute.
	=	0.463	metre per second.
1 km. per hour	=	0.624	miles per hour.
	=	54.9	ft. per minute.
	=	0.914	metre per second.

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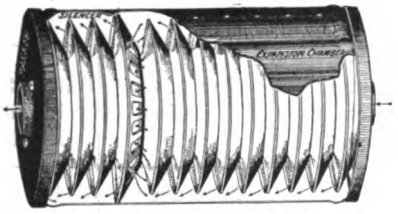
The Yankee Silent Air Cooled Muffler



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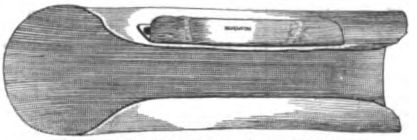
Built upon entirely new lines.
Muffles all noise completely.
Eliminates every muffler trouble.
Increases power of engine.

The Yankee Muffler is made with a series of steel discs shaped like a saucer, with edges touching, only. One-half of the discs are fluted. Each disc is a muffler in itself. Any number of discs desired are included in the galvanized pipe. As the explosion passes from the discs, every atom of sound is eliminated in the "Silencer," which contains only the light gases and is always cool.

The lightest and strongest muffler made. And the only muffler without back-pressure at all speeds of the engine. So perfect is the "Yankee" that no cut-out valve is necessary. Write for full particulars, and price.

D. B. SMITH & CO., Utica, N. Y., U.S.A.

Traver Patent Blowout Patch



FITS INSIDE OF SHOE

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A quick, effective and lasting repair for Blowouts and Rim Cuts

No. 1—For all size shoes from 28 x 3 to 32 x 3½.....**Price $3.50**
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Three Styles: Clincher, Dunlop, Fisk

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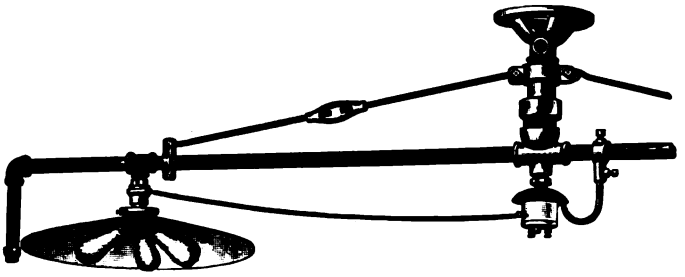
OVERHEAD VEHICLE WASHERS



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This engraving shows it with illuminating attachment for either gas or electricity, which allows washing at night or in dark places where light is needed.

Safe, Simple, Reliable. **USERS ARE ENTHUSIASTIC IN ITS PRAISE.**

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VEHICLE SPECIALTY COMPANY, Inc., Hartford, Conn.

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Rate of Speed in Miles Per Hour for Elapsed Time Over the Measured Mile From One to Three Minutes

Time Over Measured Mile		Rate of Speed in Miles per Hour	Time Over Measured Mile		Rate of Speed in Miles per Hour	Time Over Measured Mile		Rate of Speed in Miles per Hour
Min.	*Sec.*		*Min.*	*Sec.*		*Min.*	*Sec.*	
1	0	60.00	1	27	41.38	1	54	31.58
1	1	59.00	1	28	40.91	1	55	31.30
1	2	58.06	1	29	40.45	1	56	31.03
1	3	57.14	1	30	40.00	1	57	30.77
1	4	56.25	1	31	39.56	1	58	30.50
1	5	55.38	1	32	39.13	1	59	30.25
1	6	54.54	1	33	38.71	2	0	30.00
1	7	53.73	1	34	38.29	2	3	29.26
1	8	52.94	1	35	37.89	2	6	28.57
1	9	52.17	1	36	37.50	2	9	27.90
1	10	51.42	1	37	37.11	2	12	27.27
1	11	50.70	1	38	36.73	2	15	26.66
1	12	50.00	1	39	36.36	2	18	26.08
1	13	49.31	1	40	36.00	2	21	25.53
1	14	48.65	1	41	35.64	2	24	25.00
1	15	48.00	1	42	35.29	2	27	24.49
1	16	47.37	1	43	34.95	2	30	24.00
1	17	46.75	1	44	34.61	2	33	23.53
1	18	46.15	1	45	34.28	2	36	23.07
1	19	45.57	1	46	33.96	2	39	22.64
1	20	45.00	1	47	33.64	2	42	22.22
1	21	44.44	1	48	33.33	2	45	21.81
1	22	43.90	1	49	33.03	2	48	21.42
1	23	43.37	1	50	32.72	2	51	21.05
1	24	42.85	1	51	32.43	2	54	20.69
1	25	42.35	1	52	32.14	3	0	20.00
1	26	41.86	1	53	31.86	..	..	.....

Revolutions per Minute of Auto Road Wheels at Different Rates of Speed

Diameter of Wheel	MILES PER HOUR									
	2	4	6	8	10	15	20	25	30	40
Inches										
24.....	28	56	84	112	140	210	280	350	420	560
26.....	26	52	78	103	129	194	258	323	388	517
28.....	24	48	72	96	120	180	240	300	360	480
30.....	22	45	67	90	112	168	224	280	336	448
33.....	20	41	61	82	102	153	204	255	306	408
36.....	19	37	56	75	93	140	187	234	280	374
42.....	16	32	48	64	80	120	160	200	240	320

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who are interested in having only the BEST in the Ignition system of their cars are invited to correspond with us regarding the DURO Dry Storage Battery.

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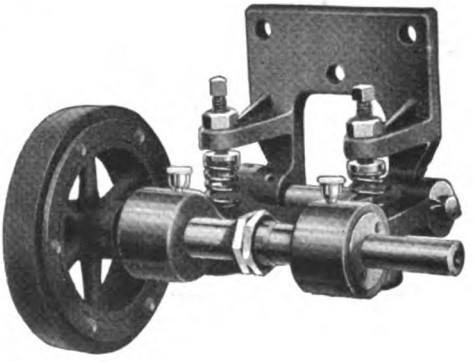
Saves 25 per cent. of your fuel—Gives 25 per cent. more power.



THE K-W IGNITOR AND DRIVING APPARATUS

Write for catalogue.

THE K-W IGNITION COMPANY, Section B, Whitney Bldg., CLEVELAND, OHIO

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Striking Energy of Automobiles (Durand)

Let W = weight of automobile, measured in pounds.
F = average force over the distance required to bring automobile to rest, measured in pounds.
L = distance over which force is exerted to bring automobile to rest, measured in feet.
V = velocity in feet per second,

Then Energy $= \frac{W V^2}{64.4}$ in foot pounds,

$F L$ = measure of destructive work done in stopping the machine.

Then $F L = \frac{W V^2}{64.4}$

$$F = \frac{W V^2}{64.4 L}$$

$$L = \frac{W V^2}{64.4 F}$$

Or, otherwise and more generally, let E be any fraction or amount of energy which is lost in overcoming an average resistance F over a distance L.
Then:

$$E = F L$$
$$F = E \div L$$
$$L = E \div F$$

In the actual case of automobile collision, F, as has been carefully noted, is merely a distance average of the force developed. It means simply that there will be as much destructive work done as would correspond to the exhibition of a force F over a distance L. Actually, the destructive work will be made up of parts, each one of which may consist of a very much larger force, acting through such smaller distance as may be needed for the rupture of the part in question.

Transmission Efficiency of Different Types of Mechanism (Worby Beaumont)

Source of Loss of Power	Amount of Loss Per Cent.	Efficiency Per Cen .
		100
When driving direct:		
One chain	3.0	....
One and one-half pairs of bearings	7.5	89.5
With epicylic speed gear in operation, add	15.0	74.5
When driving direct:		
One set of gear	5.0	....
Two pairs of bearings	10.0	....
Partially active bearings	3.0	82.0
With change-speed reduction gear in operation, add	12.0	70.0

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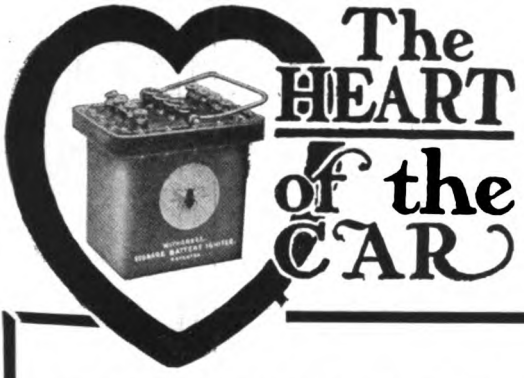

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Source of Loss of Power	Amount of Loss Per Cent.	Efficiency Per Cent.
		100
One set of gear	5.0	....
Three pairs of bearings	15.0	....
Equivalent of two chains	6.0	74.0
Two sets of gear	10.0	....
Four pairs of bearings	20.0	70.0
Two sets of gear	10.0	....
Five pairs of bearings	25.0	...
Equivalent of one chain	3.0	62.0
Equivalent of three sets of gear	15.0	....
Five pairs of bearings	25.0	60.0

Traction Effort on Various Surfaces (Norris)

On rails or plates	5.16 pounds per ton
Asphalt or hardwood	12.24 " " "
Macadam	30.60 " " "
Loose gravel	140 to 200 " " "
Sand	400 " " "
With different tires (comparatively)	
Iron	60 " " "
Solid Rubber	60 " " "
Pneumatic	45 " " "

Power Consumed in Moving a Plane Surface at Different Velocities in the Open Air (Kempe)

SPEED IN		Horse-power per Square foot of Effective Surface	SPEED IN		Horse-power per Square foot of Effective Surface
Miles per Hour	Feet per Minute		Miles per Hour	Feet per Minute	
10	880	0.013	50	4,400	1.64
15	1,320	0.044	75	6,600	5.54
20	1,760	0.105	100	8,800	13.13
25	2,200	0.205	150	13,200	44.29
30	2,640	0.354	200	17,600	105.00

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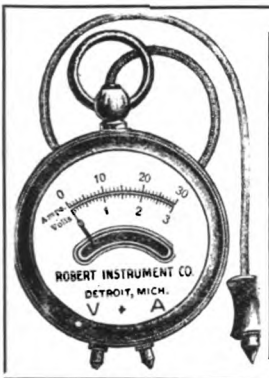

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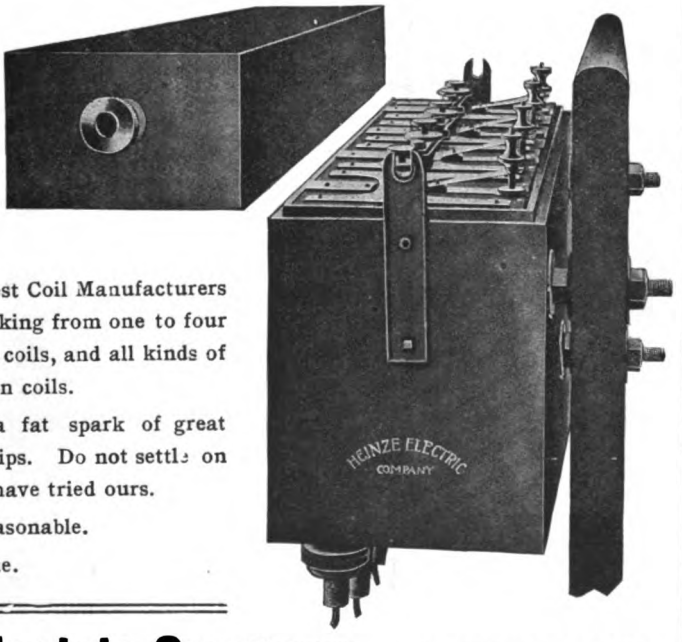

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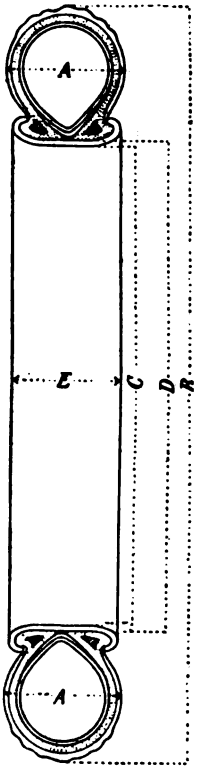

Clincher Tire and Rim Dimensions

A Inches	*B* Inches	*C* Inches	*D* Inches	*E* Inches
2 1/2	26	18 3/4	19	1 3/8
3	26	19 3/4	20	1 3/8
2 1/2 and 3	28	21 3/4	22	1 3/8
2 1/2 and 3	30	23 3/4	24	1 3/8
3	32	25 3/4	26	1 3/8
3	34	27 3/4	28	1 3/8
3	36	29 3/4	30	1 3/8
3 1/2	28	20 11/16	21	1 3/8
3 1/2	30	22 11/16	23	1 1/2
3 1/2	32	24 11/16	25	1 1/2
3 1/2	34	26 11/16	27	1 1/2
3 1/2	36	28 11/16	29	1 1/2
4	30	21 11/16	22	2
4	32	23 11/16	24	2
4	34	25 11/16	26	2
4	36	27 11/16	28	2
4 1/2	32	22 11/16	23	2 1/4
4 1/2	34	24 11/16	25	2 1/4
4 1/2	36	26 11/16	27	2 1/4

Metric Tires and Their American Equivalents

Metric Sizes	Approximate Size in Inches
650 x 65	26 x 2 1/2
700 x 65	28 x 2 1/2
750 x 65	30 x 2 1/2
800 x 65	32 x 2 1/2
830 x 65	33 x 2 1/2
860 x 65	34 x 2 1/2
700 x 85	28 x 3 1/4
750 x 85	30 x 3 1/4
800 x 85	32 x 3 1/4
860 x 85	34 x 3 1/4
760 x 90	30 x 3 1/2
810 x 90	32 x 3 1/2
840 x 90	32 x 3 1/2
870 x 90	34 x 3 1/2
910 x 90	36 x 3 1/2
960 x 90	38 x 3 1/2
1010 x 90	40 x 3 1/2
815 x 105	32 x 4

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Metric Sizes	Approximate Size in Inches
875 x 105	34 x 4
915 x 105	36 x 4
820 x 120	32 x 4 1/2-5
850 x 120	33 x 4 1/2-5
880 x 120	34 x 4 1/2-5
920 x 120	36 x 4 1/2-5
1020 x 120	40 x 4 1/2-5
1080 x 120	42 x 4 1/2-5

Proportions Between Axle Loads and Tire Sizes Adopted by American Tire Makers

2 1/2-inch tires, all diameters	225 pounds per wheel
3- inch tires, all diameters	350 " " "
3 1/2 x 28-inch tires	400 " " "
3 1/2 x 30-inch tires	450 " " "
3 1/2 x 32-inch tires	555 " " "
3 1/2 x 34-inch tires	600 " " "
3 1/2 x 36-inch tires	600 " " "
4 x 30-inch tires	550 " " "
4 x 32-inch tires	650 " " "
4 x 34-inch tires	700 " " "
4 x 36-inch tires	750 " " "
4 1/2 x 32-inch tires	700 " " "
4 1/2 x 34-inch tires	800 " " "
4 1/2 x 36-inch tires	900 " " "

For weights in excess of 1,000 pounds per wheel, 5-inch tires and over are recommended. Weights given apply to car without passengers.

Air Pressures for Inflating Pneumatic Tires Recommended by Leading Makers

Diameter of Tire, Inches	Maximum Weight on Wheel, lbs.	Air Pressure in Tire, lbs. per Square Inch
2 1/2	225	50
3	350	60
3 1/2	600	70
4	750	80
4 1/2	1,000	90
5	1,000	90

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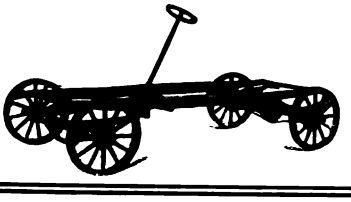

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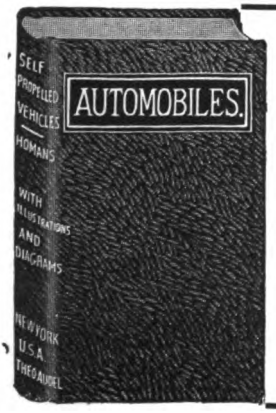

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International (Metric System) Standard 60° Threads

Diameter of Screw	Pitch	Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread
Millimetres	*Millimetres*	*Millimetres*	*Millimetres*
3	.5	2.35	.06
4	.75	3.03	.09
5	.75	4.03	.09
6	1.0	4.70	.13
7	1.0	5.70	.13
8	1.0	6.70	.13
8	1.25	6.38	.16
9	1.0	7.70	.13
9	1.25	7.38	.16
10	1.5	8.05	.19
11	1.5	9.05	.19
12	1.5	10.05	.19
12	1.75	9.73	.22
14	2.0	11.40	.25
16	2.0	13.40	.25
18	2.5	14.75	.31
20	2.5	16.75	.31
22	2.5	18.75	.31
22	3.0	18.10	.38
24	3.0	20.10	.38
26	3.0	22.10	.38
27	3.0	23.10	.38
28	3.0	24.10	.38
30	3.5	25.45	.44
32	3.5	27.45	.44
33	3.5	28.45	.44
34	3.5	29.45	.44
36	4.0	30.80	.5
38	4.0	32.80	.5
39	4.0	33.80	.5
40	4.0	34.80	.5
42	4.5	36.15	.56
44	4.5	38.15	.56
45	4.5	39.15	.56
46	4.5	40.15	.56
48	5.0	41.51	.63
50	5.0	43.51	.63
52	5.0	45.51	.63
56	5.5	48.86	.69
60	5.5	52.86	.69
64	6.0	56.21	.75
68	6.0	60.21	.75
72	6.5	63.56	.81
76	6.5	67.56	.81
80	7.0	70.91	.88

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United States Standard 60° Screw Threads

Diameter of Screw	Threads per Inch	Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread
1/4	20	.185	.0062
5/16	18	.2403	.0069
3/8	16	.2936	.0078
7/16	14	.3447	.0089
1/2	13	.4001	.0096
9/16	12	.4542	.0104
5/8	11	.5069	.0114
3/4	10	.6201	.0125
7/8	9	.7307	.0139
1	8	.8376	.0156
1 1/8	7	.9394	.0179
1 1/4	7	1.0644	.0179
1 3/8	6	1.1585	.0208
1 1/2	6	1.2835	.0208
1 5/8	5 1/2	1.3888	.0227
1 3/4	5	1.4902	.0250
1 7/8	5	1.6152	.0250
2	4 1/2	1.7113	.0278
2 1/4	4 1/2	1.9613	.0278
2 1/2	4	2.1752	.0313
2 3/4	4	2.4252	.0313
3	3 1/2	2.6288	.0357
3 1/4	3 1/2	2.8788	.0357
3 1/2	3 1/4	3.1003	.0385
3 3/4	3	3.3170	.0417
4	3	3.5670	.0417
4 1/4	2 7/8	3.7982	.0435
4 1/2	2 3/4	4.0276	.0455
4 3/4	2 5/8	4.2551	.0476
5	2 1/2	4.4804	.0500
5 1/4	2 1/2	4.7304	.0500
5 1/2	2 3/8	4.9530	.0526
5 3/4	2 3/8	5.2030	.0526
6	2 1/4	5.4226	.0556

STANDARD PROPORTIONS FOR MACHINE SCREWS.

The report of the committee on standard proportions for machine screws of the American Society of Mechanical Engineers is published in the October, 1906, proceedings of the society. The report is substantially in agreement with the recommendations adopted at the joint meeting held in New York, April 11, 1904.

The committee believes the following combined details to be essential in establishing and maintaining a standard for the diameters, threads and heads of machine screws, including, as it does, diameters, threads and limits for the taps which are to be used in connection therewith: (*a*) form of thread, (*b*) diameters, (*c*) number of threads per inch, (*d*) standard reference thread gauges, basic and for screws and taps, (*e*) working gauges for screws and taps, (*f*) limits of variation, measured in the angle of the thread, (*g*) limits of variation in external diameter, (*h*) limits of variation in the pitch of the thread, screws and taps, (*k*) proportions of the heads.

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Properties of Gasoline and Denatured Alcohol (Muntz)

Properties	Gasoline	Denatured Alcohol
Carbon	84.3 per cent.	41.5 per cent.
Hydrogen	15.7 per cent.	13.0 per cent.
Oxygen	.....	45.5 per cent.
Density at 15° C	.708	.834
Boiling point	88° C.	78.5° C.
Calories per Kg	*11,359.65	‡6,521.75
Weight evaporated per hour per dm.² (15.5 sq. in.) of surface:		
1. In experiment room; 18° C	9.37 g. (0.33 oz.)	3.47 g. (0.12 oz.)
2. Outside in the sun; 25° C	47.21 g. (1.66 oz.)	27.08 g. (0.95 oz.)

* 1,302 British heat units per lb. ‡ 752 British heat units per lb.

Specific Gravities Corresponding to Baumé Scale at 60° Fah.

Baumé Degrees	Specific Gravity	Baumé Degrees	Specific Gravity
63	0.728	72	0.695
64	0.724	73	0.692
65	0.720	74	0.689
66	0.717	75	0.685
67	0.713	76	0.682
68	0.709	77	0.679
69	0.706	78	0.675
70	0.702	79	0.672
71	0.699	80	0.669

Reversible Chemical Equations Showing Changes Which Take Place in the Lead Storage Battery (Lamar Lyndon)

CHARGE

$$\longleftarrow$$

(a) $PbO_2 + H_2SO_4 = PbSO_4 + H_2O + O$

(b) $Pb + H_2SO_4 = PbSO_4 + H_2$

(c) $c = (a) + (b) = PbO_2 + Pb + 2H_2SO_4 = 2PbSO_4 + 2H_2O$ (2)

$$\longrightarrow$$

DISCHARGE

Equation (*a*) expresses the reactions at the positive plate; (*b*) those at the negative. and (*c*) the combined effect is the fundamental equation of the lead storage battery.

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Formulas for Conversion of Thermometer Scales

To convert degrees, Centigrade or Réaumur, into degrees Fahrenheit:

Let F = No. of degrees Fahrenheit.
C = " " " Centigrade.
R = " " " Réaumur.

$$F = \frac{9C}{5} + 32; \qquad F = \frac{9R}{4} + 32:$$

$$C = \frac{5\,(F - 32)}{9} \qquad R = \frac{4\,(F - 32)}{9}$$

Freezing point, or 32° Fah. = zero in Cent. or Réaumur.
Boiling point, or 212° Fah. = 100° Cent., or 80° Réaumur.

French and American Equivalent Measures

MEASURES OF LENGTH

French	*United States*
1 meter	39.37 inches, or 3.28083 feet
.3048 meter	1 foot
1 centimeter	.3937 inch
2.54 centimeters	1 inch
1 millimeter	.03937 inch, or 1/25 inch nearly
25.4 millimeters	1 inch
1 kilometer	1093.61 yards, or .62137 mile

MEASURES OF WEIGHT

1 gramme	15.432 grains
.0648 gramme	1 grain
28.35 grammes	1 ounce avoirdupois
1 kilogramme	2.2046 pounds
.4536 kilogram	1 pound
1 tonne or metric ton	.9842 ton of 2,240 pounds 19.68 cwt.
1000 kilograms	2204.6 pounds

MEASURES OF CAPACITY

1 liter (1 cubic decimeter)	61.023 cubic inches .03531 cubic foot. .2642 gallon (American) 2.202 pounds water at 62° F.
28.317 liters	1 cubic foot
4.543 liters	1 gallon (British)
3.785 liters	1 gallon (American)

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Table of Decimal Equivalents of Vulgar Fractions of an Inch in Common Use

	1/64	.0156		17/64	.2656		33/64	.5156		49/64	.7656
	1/32	.0312		9/32	.2812		17/32	.5312		25/32	.7812
	3/64	.0468		19/64	.2968		35/64	.5468		51/64	.7968
1/16		.0625	5/16		.3125	9/16		.5625	13/16		.8125
	5/64	.0781		21/64	.3218		37/64	.5781		53/64	.8281
	3/32	.0937		11/32	.3437		19/32	.5937		27/32	.8437
	7/64	.1093		23/64	.3593		39/64	.6093		55/64	.8593
1/8		.125	3/8		.375	5/8		.625	7/8		.875
	9/64	.1406		25/64	.3906		41/64	.6406		57/64	.8906
	5/32	.1562		13/32	.4062		21/32	.6562		29/32	.9062
	11/64	.1718		27/64	.4218		43/64	.6718		59/64	.9218
3/16		.1875	7/16		.4375	11/16		.6875	15/16		.9375
	13/64	.2031		29/64	.4531		45/64	.7031		61/64	.9531
	7/32	.2187		15/32	.4687		23/32	.7187		31/32	.9687
	15/64	.2343		31/64	.4843		47/64	.7343		63/64	.9843
1/4		.25	1/2		.5	3/4		.75	1		1.0

Table of Approximate Capacities in Liquid Gallons

1	2	3	4	5	6	7	8	9	10	Gallons	Gal'ns per Inch
5 x 12	6x18	6x24	6x36	6x42						6″ diam'r	.122
	7x12	7x18	7x24	7x30	7x36	7x42	7x48			7″ "	.165
		8x15	8x18	8x24	8x30	8x36	8x42	8x45	8x48	8″ "	.217
		9x12	9x15	9x18	9x24	9x30	9x34	9x36	9x40	9″ "	.275
					10x20	10x24	10x26	10x28	10x32	10″ "	.340
						12x16	12x18	12x20	12x24	12″ "	.486

10	15	20	25	30	35	40	45	50	Gallons	Gal'ns per Inch
8x48									8″ diam'r	.217
9x40									9″ "	.275
10x32	10x48								10″ "	.340
12x24	12x34	12x42	12x50	12x60					12″ "	.486
14x18	14x24	14x30	14x38	14x44	14x52	14x60			14″ "	.666
	16x18	16x24	16x30	16x36	16x42	16x48	16x54	16x60	16″ "	.870

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The Automobile Trade Directory

A Classified List, issued quarterly, containing the Names and Addresses of all American Manufacturers of Automobiles, Commercial Vehicles, Motor Boats, Motor Cycles and of all makers of component Parts and Accessories

VOL. V No. 2
APRIL, 1907

Subscription Price $1.00 per year
Single Copies 25 Cents, Postpaid

Published by
The Class Journal Company
Flatiron Building, New York

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The Automobile Trade Directory

PUBLICATION OFFICE:
Flatiron Building, New York
ROBERT WOLFERS, *Manager*

WESTERN OFFICE:
625 Monadnock Block, Chicago
H. H. GILL, *Representative*

ADDRESS ALL COMMUNICATIONS TO
The Automobile Trade Directory
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TO THE TRADE

IN compiling this Directory we have included all the available names of American manufacturers of complete automobiles, commercial vehicles, motor boats and motor cycles, and of all makers of parts and accessories.

Manufacturers' names are classified under the headings of the various products, and the classifications are completely indexed. We will consider it a favor if manufacturers will notify us at once in case their names are not included in the Directory, or the information given is in any way incorrect or incomplete, as it is our intention to make the Directory of unquestionable accuracy.

For the convenience of mechanical engineers and purchasing agents we have incorporated a department under the heading "Tables and Data for Engineers." This information has been compiled from authoritative sources with a view to its usefulness to those actively engaged in the automobile industry. In subsequent editions additional tables and data will be included and any suggestions or data which will make this department more valuable and which our readers may favor us with will be appreciably received.

THE PUBLISHERS

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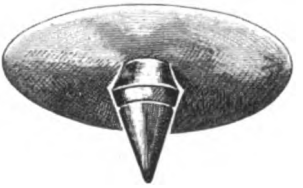

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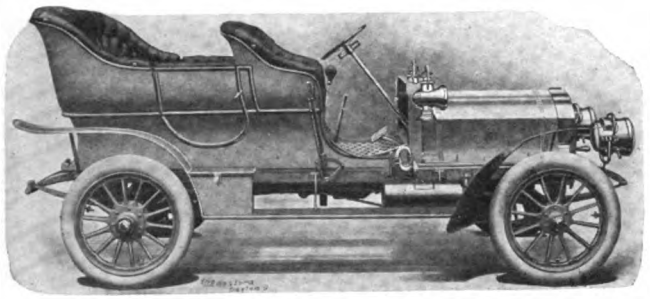
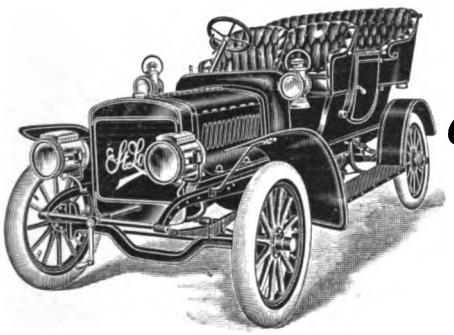


The car that strikes the ideal medium between ex orbitant frills and cheap unworthiness.

The **Stoddard-Dayton** leads in sales—because its worth is not upon paper, but in the car. Because one machine sells another. Because the makers back up the agent, and back up the purchaser, with a guarantee that works out as splendidly as it promises. The handsomest car of all—standard finish, pearl gray with tan upholstering; other colors optional with purchaser.

Stoddard-Dayton Model D. 4-cylinder, vertical motor, 4½x5 cylinders, 30-35 H.P., selective type sliding gear transmission, 3 speeds and reverse, controlled by a single lever operating in a guide of the H-slot type. Operator can pass from any gear to other gear at will, up hill or down without noise or clashing. Roller bearings throughout, floating type, clutch driven rear axle with large bevel gears, mechanical lubrication. 2,100 pounds, $2,250. Advance catalog ready. Write for our new catalog fully describing the Stoddard Dayton Touring Car, Runabout and Limousine for 1907.

DAYTON MOTOR CAR CO., DAYTON, O.



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PEORIA, ILL.

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GASOLINE CARS (Continued)

COLUMBIA Electric Co., Knightstown, Ind.

CONOVER Motor Car Co., The, Paterson, N. J.

CORBIN Motor Vehicle Corporation, New Britain, Conn.

COVERT Motor Vehicle Co., 57 Richmond Ave., Lockport, N. Y.

CRAIG-Toledo Motor Co. (The), Gardner Bldg., Toledo, O.

CRAWFORD Auto Co., Hagerstown, Md.

CROESUS Motor Car Co., 216 E. 11th St., Kansas City, Mo.

DAIMLER Mfg. Co., Long Island City, N. Y.

DAYTON Motor Car Co., Dayton, O. (see page 13).

DEERE-Clark Motor Car Co., Moline, Ill.

DE LUXE Motor Car Co., Detroit, Mich.

DESMARAIS & Co., Prospect St., Bristol, Conn.

DETROIT Auto Vehicle Co., 65-71 Catherine St., Detroit, Mich.

DIAMOND T Motor Car Co., Chicago, Ill.

DOLSON Automobile Co., Charlotte, Mich.

DORRIS Motor Car Co., 1211-1217 N. Vandewater Ave., St. Louis, Mo.

DRAGON Automobile Co., 30th and Chestnut Sts., Philadelphia, Pa.

DUPLEX Automobile Works, 4212 State St., Chicago, Ill.

DUROCAR Mfg. Co., 1130 South Main St., Los Angeles, Cal.

DURYEA Power Co., Reading, Pa.

EAGLE Automobile Co., Rahway, N. J.

EASTON Machine Co., South Easton, Mass.

ELECTRIC Vehicle Co. (The), Hartford, Conn.

ELMORE Mfg. Co., Clyde, O.

EUREKA Motor Co., Seattle, Wash.

EVANSVILLE Auto. Co., 5th and Locust St., Evansville, Ind.

FEDERAL Automobile Co., 1334 First National Bk. Bldg., Chicago, Ill.

FEE Motor Car Co., Detroit, Mich.

FORD Motor Co., Detroit, Mich.

FOREST City Motor Car Co., Massilon, O.

FRANKLIN Mfg. Co., H. H., Syracuse, N. Y.

GAETH Auto Wks., 900 Pearl St., Cleveland, Ohio.

GEARLESS Transmission Co., Rochester, N. Y.

GROUT Bros. Automobile Co., Orange, Mass.

HARPER Buggy Co., Columbia City, Ia.

HAMBRICK Motor Car Co., Washington, Ind.

HARRISON Wagon Co., Grand Rapids, Mich.

HATFIELD Motor Vehicle Co., Cortland, N. Y.

HAWLEY Automobile Co., Ltd., Constantine, Mich.

HAY-BERG Motor Car Co., Burleigh and Weil Sts., Milwaukee, Wis.

HAYDOCK Automobile Mfg. Co., D. W., St. Louis, Mo.

HAYNES Automobile Co. (The), Kokomo, Ind.

HEWITT Motor Co., 10 E. 31st St., N. Y. City.

HILL Motor Car Co., Haverhill, Mass.

HOLMES Vehicle Co., East Boston, Mass.

HOLSMAN Auto Co., Monadnock Block, Chicago, Ill.

HUNTINGTON Automobile Co. (The), Huntington, L. I., N. Y.

IDEAL Runabout Mfg. Co., 105 Baynes St., Buffalo, N. Y.

INTERNATIONAL Harvester Co., Akron, O.

IROQUOIS Motor Car Co., Seneca Falls, N. Y.

IVERSON & Co., J. C., 425 Water St., Milwaukee, Wis.

JACKSON Automobile Co., Jackson, Mich.

JEFFERY, Thos. B. & Co., Kenosha, Wis.

JENKINS, J. W., Rochester, N. Y.

KERMATH Motor Car Co., Detroit, Mich.

KIBLINGER Co., W. H., Auburn, Ind.

KISSEL Motor Car Co., Hartford, Wis.

KLINK Motor Car Mfg. Co., Dansville, N. Y.

KNIGHT & Kilbourn, 1240 Michigan Ave., Chicago, Ill.

KNOX Automobile Co., Springfield, Mass.

KRUEGER Mfg. Co., 52-56 Biddle St., Milwaukee, Wis.

LA SALLE Niagara Auto Co., Niagara Falls, N. Y.

LEAR Auto Co., Oscar, Columbus, O.

LEBANON Motor Wks., Lebanon, Pa.

LEHR Agricultural Co., Fremont, O.

LOCOMOBILE Co. of America (The), Seaside Park, Bridgeport, Conn.

LOGAN Construction Co., Chillicothe, O.

LOZIER Motor Co. (The), 55th St. & Broadway, N. Y. City.

LUVERNE Automobile Co., Luverne, Minn.

MACK Bros. Motor Car Co., Allentown, Pa.

MAPLEBAY Mfg. Co., Crookston, Minn.

MARION Motor Car Co., W. 15th St. and Big Four Ry., Indianapolis, Ind.

MARVEL Motor Car Co., 284-290 Rivard St., Detroit, Mich.

MASON Motor Car Co., E. 5th and Vine Sts., Des Moines, Ia.

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MATHESON Motor Car Co., Wilkesbarre, Pa.

MATTHEWS Motor Co., Camden, N. J.

MAXWELL-Briscoe Motor Co., Tarrytown, N. Y.

MED-Bow Auto Co., Springfield, Mass.

MENGES Motor Car Co., 16-18 Mill St., Grand Rapids, Mich.

METEOR Automobile Works (The), Bettendorf, Ia.

MITCHELL Motor Car Co., Racine Junction, Wis.

MODEL Automobile Co., Peru, Ind.

MODERN Tool Co., Erie, Pa.

MOLINE Auto Co., E. Moline, Ill.

MOLINE Pump Co., Moline, Ill.

MONARCH Motor Co., 404 Monadnock Block, Chicago, Ill.

MOON Motor Car Co., St. Louis, Mo.

MOORE Auto Co., 571 5th Ave., N. Y. City.

MORA Motor Car Co., 317 Livingston Bldg., Rochester, N. Y.

MOTORCAR Co. (The), Detroit, Mich.

NAPIER Motor Car Co. of Amer., Boston, Mass.

NATIONAL Motor Vehicle Co., Indianapolis, Ind.

NEILSEN Motor Car Co., Detroit, Mich.

NORDYKE & Marmon Co., Indianapolis, Ind.

NORTHERN Motor Car Co., Detroit, Mich.

OKEY Motor Car Co., The, 9 Kimball St., Columbus, O.

OLDS Motor Works, Lansing, Mich.

OVERLAND Automobile Co., Standard Ave. and Division St., Indianapolis, Ind.

PACKARD Motor Car Co., Detroit, Mich.

PAGE Gas Engine Co., Adrian, Mich.

PAGE Motor Vehicle Co. (The), Providence, R. I.

PALMER Automobile Mfg. Co., Schofield Bldg., Cleveland, O.

PEERLESS Motor Car Co. (The), Lisbon, St., Cleveland, O.

PENNSYLVANIA Auto Motor Co., Bryn Mawr, Pa.

PERFECTION Automobile Co., South Bend, Ind.

PIERCE Engine Co., Racine Junction, Wis.

PIERCE, The Geo. N. Co., 6-22 Hanover St., Buffalo, N. Y.

POPE Motor Car Co., Hartford, Conn.

POPE Mfg. Co., Hagerstown, Md.

POPE Motor Car Co., Toledo, O.

POSTAL Auto & Engine Co., Bedford, Ind.

PRACTICAL Automobile Co., Genoa, Ill.

PREMIER Motor Mfg. Co., Indianapolis, Ind.

PULLMAN Automobile Co., Peru, Ind.

PUNGS-Finch Auto & Gas Eng. Co., Detroit, Mich.

RAINIER Co. (The), Saginaw, Mich.

RELIABLE Dayton Motor Car Co., 375 W. Lake St., Chicago, Ill.

REO Motor Car Co., Lansing, Mich.

ROSSLER Mfg. Co., C., Buffalo, N. Y.

ROYAL Motor Car Co., Cleveland, O. (see page opposite).

ST. LOUIS Car Co., St. Louis, Mo.

ST. LOUIS Motor Car Co., Peoria, Ill. (see page 13).

SAMPSON, Alden Co., Pittsfield, Mass.

SELDEN Motor Vehicle Co., Despatch, N. Y.

SCHACT Mfg. Co. (The), 2727 Spring Grove Ave., Cincinnati, O.

SCHNADER, Milton H., Reading, Pa.

SHAWMUT Motor Co., Stoneham, Mass.

SHOEMAKER Automobile Co., 88-90 Exchange St., Freeport, Ill.

SIMPLEX Motor Car Co., Mishawaka, Ind.

SMITH Auto Co., 618 Quincy St., Topeka, Kan.

SMITH & Mabley, 7th Ave. and 38th St., New York.

SOMMER Motor Co., 152 Congress St. E., Detroit, Mich.

SPRINGFIELD Automobile Co., Springfield, Mass.

STANLEY Auto & Mfg. Co., Moreland, Ind.

STAVER Carriage Co. (The), 76th and Wallace Sts., Chicago, Ill.

STEARNS, The F. B. Co., Euclid and Lake View Aves., Cleveland, O.

STEVENS Arms & Tool Co., J., Chicopee Falls, Mass.

STILSON Motor Car Co., Pittsfield, Mass.

STREATOR Motor Car Co., Streator, Ill.

STUDEBAKER Automobile Co., South Bend, Ind.

SUCCESS Auto-Buggy Mfg. Co., 528 De Balliviere Ave., St. Louis, Mo.

SUNSET Automobile Co., San Francisco, Cal.

THOMAS-Detroit Co., E. R., Detroit, Mich.

THOMAS, E. R., Motor Co., 1209 Niagara St., Buffalo, N. Y.

TINCHER Motor Car Co., South Bend, Ind.

TRIUMPH Motor Car Co., Cragin Station, Chicago, Ill.

TWYFORD Motor Car Co., Brookville, Pa.

UNIVERSITY Automobile Co., New Haven, Conn.

VICTOR Automobile Mfg. Co., 171 Carroll St., St. Louis, Mo.

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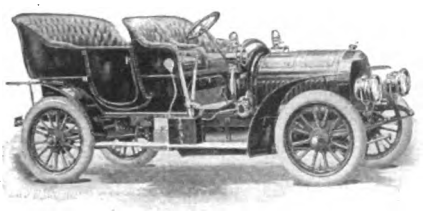

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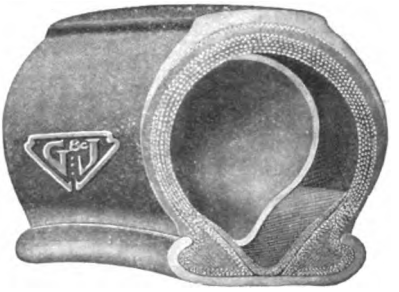

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Omaha Rubber Shoe Co., Omaha, Neb.
Pittsburg Rubber Co., Pittsburg, Pa.
Enterprise Rubber Co., Boston, Mass.

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VICTORY Motor Car Co., San Jose, Cal.

WALTER Auto Co. (The), Trenton, N. J.

WALTHAM Mfg. Co., Waltham, Mass.

WASHINGTON Motor Car Co., Washington, Ind.

WATERLOO Motor Works, Waterloo, Ia.

WAYNE Automobile Co., Detroit, Mich.

WAYNE Works, Richmond, Ind.

WELCH Motor Car Co., Pontiac, Mich.

WESTERN Tool Works, Galesburg, Ill.

WILCOX Motor Car Co., H. E., 11th Ave. and Marshall St., N. E., Minneapolis, Minn.

WINTON Motor Carriage Co. (The), Cleveland, O.

WOODS Motor Veh. Co., Chicago, Ill.

YORK Motor Car Co., Inc., York, Pa.

ZENT Auto Co., Bellefontaine, O.

GASOLINE COMMERCIAL VEHICLES

AMERICAN Foundry Co., Leipsic, O.

AMERICAN Machine Mfg. Co., 133-137 Beaubien St., Detroit, Mich.

AMERICAN Motor Truck Co., Lockport, N. Y.

AUTO-CAR Equipment Co., 77-79 Edward St., Buffalo, N. Y.

BARBER Asphalt Co., Philadelphia, Pa.

BUCKEYE Mfg. Co.. Anderson, Ind.

BUFFALO Auto-Truck & Motor Co., 35 Mississippi St., Buffalo, N. Y.

CADILLAC Motor Car Co., Detroit, Mich.

CHASE Motor Truck Co., 232 E. Water St., Syracuse, N. Y.

CHICAGO Commercial Auto Mfg. Co., Chicago, Ill.

COMMERCIAL Motor Car Co. (The), 4 E. 42d St., N. Y. City.

COMMERCIAL Motor Co., Marion, N. J.

COMMERCIAL Motor Truck Co., Plymouth, Ohio.

COMMERCIAL Truck Co., Philadelphia, Pa.

CONSOLIDATED Motor Co., 148 W. 56th St., New York.

COPPOCK Motor Car Co., Marion, Ind.

CORBIN Motor Car Corp., New Britain, Conn.

DAIMLER Mfg. Co., 959 Steinway Ave., Long Island City, N. Y.

DEERE-Clark Motor Car Co., Moline, Ill.

DURYEA Power Co., Reading, Pa.

EMPIRE State Engineering Works, 555 E. 116th St., New York City.

GAETH Automobile Works, Cleveland, O.

HAMBRICK Motor Car Co., Washington, Ind.

HEWITT Motor Co., 10 E. 31st St., N. Y. City.

HINDE & Dauch, Sandusky, O.

HUBER Auto Co., Atwater and Antoine Sts., Detroit, Mich.

IDEAL Mfg. Co., Portsmouth, O.

IROQUOIS Iron Works, Buffalo, N. Y.

JEFFERY & Co., Thos. B., Kenosha, Wis.

KANSAS City Motor Car Co., Sheffield, Mo.

KARBACH Automobile & Vehicle Co., Omaha, Neb.

KNOX Automobile Co., Springfield, Mass.

KNOX Motor Truck Co., Springfield, Mass. (see page opposite).

LEAR Automobile Co., Oscar, Columbus, O.

LOGAN Construction Co., Chillicothe, O.

MACK Bros. Motor Car Co., Allentown, Pa.

MARION Motor Car Co., Indianapolis, Ind.

MATHESON Motor Car Co., Wilkesbarre, Pa.

MAXWELL-Briscoe Motor Co., Tarrytown, N. Y.

McNAUGHTON Co., Jas., Mutual Life Bldg., Buffalo, N. Y.

MEISELBACH Motor Wagon Co., North Milwaukee, Wis.

MILLER Garage Co., Inc., Bridgeport, Conn.

MITCHELL Motor Car Co., Racine, Wis.

MODEL Automobile Co., Peru, Ind.

MOTORCAR Co., Detroit, Mich.

MURILLO Motor Car Co., Marion, Ind.

NEILSEN Motor Car Co., Detroit, Mich.

NORTHERN Motor Car Co., Detroit, Mich.

OLDS Motor Works, Lansing, Mich.

PACKARD Motor Car Co., Detroit, Mich.

PONTIAC Motor Car Co., Pontiac, Mich.

POPE Motor Car Co., Hartford, Conn.

PREMIER Motor Mfg. Co., Indianapolis, Ind.

RAPID Motor Vehicle Co., Pontiac, Mich.

RELIANCE Motor Car Co., 67 E. Fort St., Detroit, Mich.

REO Motor Car Co., Lansing, Mich.

SAYERS & Scovill, 2247-2261 Colerain Ave., Cincinnati, O.

SHEFFIELD Car Co., Three Rivers, Mich.

SHOP of Siebert (The), Toledo, O.

SOULES Motor Car Co., Detroit, Mich.

STEVENS Arms & Tool Co., J., Chicopee Falls, Mass.

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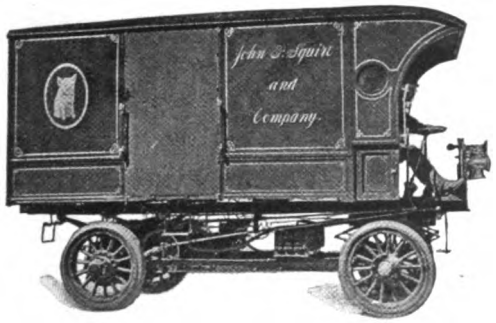

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TORBENSEN Motor Car Co., Bloomfield, N. J.

WESTERN Tool Works, Galesburg, Ill.

WHITMAN Agricultural Co., St. Louis, Mo.

WORTH Motor Car Mfg. Co., 219 Upper First St., Evansville, Ind.

ELECTRIC RUNABOUTS AND CARRIAGES

AMERICAN Electromobile Co., Detroit, Mich.

BABCOCK Electric Carriage Co., 240 W. Utica St., Buffalo, N. Y.

BAILEY & Co., Inc., S. R., Amesbury, Mass.

BAKER Motor Vehicle Co., 116 Jesse St., Cleveland, O.

BRUNN'S Carriage Manufactory, 1140-1148 Main St., Buffalo, N. Y.

CANTONO Electric Tractor Co., 111 West 37th St., New York.

COLUMBUS Buggy Co., Columbus, O.

ELECTRIC Vehicle Co., Hartford, Conn.

ELECTRIC Vehicle Equipment Co., 20th and Montgomery Ave., Philadelphia, Pa.

GENERAL Vehicle Co., Borden and Review Aves., Long Island City, N. Y.

HOLSON Motor Patents Co., Ltd., Grand Rapids, Mich.

LANSDEN Co. (The), 54 Lackawanna Ave., Newark, N. J.

NATIONAL Motor Vehicle Co., 2100 E. 22nd St., Indianapolis, Ind.

PARSONS Elec. Motor Carriage Co., Cleveland, O.

POPE Motor Car Co., Indianapolis, Ind.

RAUCH & Lang Carriage Co. (The), 406 Superior St., Cleveland, O.

STUDEBAKER Automobile Co., South Bend, Ind.

SYNNESTVEDT Machine Co., 4117 Liberty Ave., Pittsburgh, Pa.

WOODS Motor Vehicle Co., Chicago, Ill.

ELECTRIC COMMERCIAL VEHICLES

AMERICAN Electromobile Co., Detroit, Mich.

AUTO-CAR Equipment Co., Inc., 1453-59 Niagara St., Buffalo, N. Y.

CANTONO Electric Tractor Co., 111 W. 37th St., New York.

CHAMPION Wagon Co., Owego, N. Y.

COUPLE-Gear Freight-Wheel Co., 604 Pythian Temple, Grand Rapids, Mich.

ELECTRIC Vehicle Co., Hartford, Conn.

ELWELL-Parker Electric Co., 1076 Hamilton St., Cleveland, O.

GENERAL Vehicle Co., Borden and Review Aves., Long Island City, N. Y.

HOLSON Motor Patents Co., Ltd., Grand Rapids, Mich.

LANSDEN Co. (The), Newark, N. J.

McNAUGHTON Co., James, 503 Mutual Life Bldg., Buffalo, N. Y.

McCREA Motor Truck Co. (The), Am. Trust Bldg., Cleveland, O.

PITTSBURG Motor Veh. Co., Pittsburg, Pa.

POPE Motor Car Co., Indianapolis, Ind.

STUDEBAKER Automobile Co., South Bend, Ind.

SYNNESTVEDT Machine Co., 4117 Liberty Ave., Pittsburgh, Pa.

STEAM PLEASURE VEHICLES

BELKNAP Motor Car Co., Detroit, Mich.

CLARK, Edward S., 272 Freeport St., Boston, Mass.

ESSEX Motor Car Co., 60 State St., Boston, Mass.

JOHNSON Service Co., 149-153 Michigan St., Milwaukee, Wis.

LANE Motor Vehicle Co., Poughkeepsie, N.Y.

ROSS, Louis S., Newtonville, Mass.

STANLEY Motor Carriage Co., Newton, Mass.

TERWILLIGER & Co., Wm. B., 32 Division St., Amsterdam, N. Y.

TWOMBLY Motor Carriage Co., 52 Broadway, New York.

WHITE Co. (The), Rose Bldg., Cleveland, O.

STEAM COMMERCIAL VEHICLES

AMERICAN-Coulthard Co., Peabody, Mass.

COLUMBIA Engineering Works, William and Emlay Sts., Brooklyn, N. Y.

COMMERCIAL Truck & Power Co., 171 Main St., Rahway, N. J.

JOHNSON Service Co., 149-153 Michigan St., Milwaukee, Wis.

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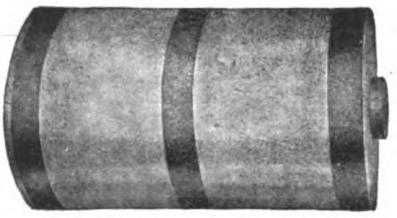

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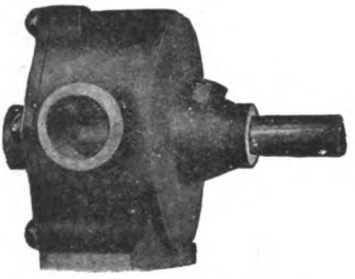

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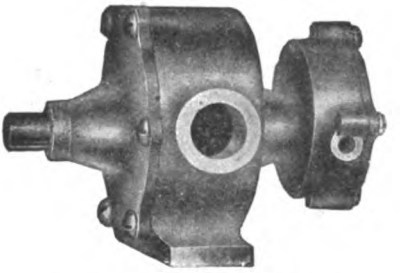

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AMERICAN Dynamic Co., Port Richmond, N. Y.

AMERICAN Yacht & Motor Co., Cherokee and DeKalb Sts., St. Louis, Mo.

ATLANTIC Co. (The), Amesbury, Mass.

AUTO Boat Co., West Mystic, Conn.

AYERS & Son, A., Nyack, N. Y.

BARRETT'S Son, A., Camden, Me.

BAY Ridge Launch Works, foot 39th St., Brooklyn, N. Y.

BEERS Bros. Engine Co., Culver Road, Rochester, N. Y.

BELLOWS, M. S., Chateaugay Lake, N. Y.

BENTER, Worth S., Catskill, N. Y.

BROOKS Boat Mfg. Co., Bay City, Mich.

BUFFUM Co., H. H., Abingdon, Mass.

BURGESS & Packard, Board of Trade Bldg., Boston, Mass.

CHASE Yacht & Eng. Co., Providence, R. I.

CHURCH Motor & Launch Co., 62 William St., New York City.

CONSOLIDATED Motor Co., 148 W. 56th St., New York.

DeMOOY Bros., 765 Willson Ave., Cleveland, Ohio.

DETROIT River Boat & Oar Co. (The), Wyandotte, Mich.

DOMAN Co., H. C., Oshkosh, Wis.

DUTTON Engineering Co., Perth Amboy, N. J.

ELECTRIC Launch Co. (The), Bayonne, N. J.

EMMONS Co., E. Gerry, Swampscott, Mass.

FAIRBANKS-Grant Mfg. Co., Ithaca, N. Y.

FAIRBANKS, Morse & Co., Chicago, Ill.

FAY & Bowen, 92 Lake St., Geneva, N. Y.

FRASER Hollow Spar & Boat Co., Greenport, L. I.

GAS Engine & Power Co., and Chas. L. Seabury Co., Morris Heights, N. Y. City.

GERE Launch & Engine Works, 234 Palisade Ave., Yonkers, N. Y.

GLOBE Iron Works, Menomonie, Wis.

HANKSCRAFT Co., Madison, Wis.

HENERHOFF Mfg. Co., Bristol, R. I.

HEPBURN, J. W., Toledo, O.

HOLMES Motor Co., West Mystic, Conn.

HUNTINGTON Mfg. Co., New Rochelle, N. Y.

ISHAM Co., Norwich, Conn.

JACOB, R., City Island, N. Y.

JONES & Laborde, Oshkosh, Wis.

KIDNEY, Dan & Son, West DePere, Wis.

LAKE Shore Engine Works, Marquette, Mich.

LAMB Boat & Engine Co., Clinton, Ia.

LANLEY & Son Corp., South Boston, Mass.

LEGARE, J. L., Ogdensburg, N. Y.

LEIGHTON, H. J., Syracuse, N. Y.

LOZIER Motor Co. (The), Broadway and 55th St., New York City.

MARBLEHEAD Yacht Yard, Marblehead, Mass.

MARINE Eng. & Mach. Co., Harrison, N. J.

MATHER, The C. B., Corporation, 56 Merrimac St., Newburyport, Mass.

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MEDART, Fred, St. Louis, Mo.

MIANUS Motor Works, Mianus, Conn.

MICHIGAN Steel Boat Co., 1252 Jefferson Ave., Detroit, Mich.

MILTON Point Shipyard, Rye, N. Y.

MILTON, T. M., Brewerton, N. Y.

MINNESOTA Boat & Power Wks., Stillwater, Minn.

MULLINS Co., W. H., 124 Franklin St., Salem, O.

MURRAY & Tregurtha Co., 340 W. First St., Boston, Mass.

NEW York Kerosene Oil Engine Co., 31 Burling Slip, New York.

N. Y. Yacht, Launch & Engine Co., Morris Heights, N. Y.

NOCK, F. S., East Greenwich, R. I.

NORWALK Launch Co., Norwalk, Conn.

OSHKOSH Boat Works, Oshkosh, Wis.

OUTING Boat Co., Marquette Bldg., Chicago, Ill.

PALMER Bros., Coscob, Conn.

PELTON Gaso. Engine Works, Lyons, Ia.

PERKINS Launch & Motor Co., Gloucester, Mass.

PIERCE Engine Co., Racine Junction, Wis.

PIERSON Boat Construction Co., Duluth, Minn.

PUNGS-Finch Co., Detroit, Mich.

RACINE Boat & Canoe Co., Racine, Wis.

RACINE Boat Mfg. Co., Muskegon, Mich.

RED Wing Boat Mfg. Co., Red Wing, Minn.

ROCHESTER Gas Eng. Co., Rochester, N. Y.

SEITZ Co., F. A., 141 Frelinghuysen Ave., Newark, N. J.

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TRUSCOTT Boat Mfg. Co., St. Joseph, Mich.

WATERTOWN Motor Co., Watertown, N. Y.

WILLIAMS-Whittlesey Co., Long Island City, N. Y.

WOLVERINE Motor Works, 130 So. Front St., Grand Rapids, Mich.

WOOD, B. F., City Island, N. Y.

WRIGHT, U. G., Paulsboro, N. J.

YACHT, Launch & Eng. Co., Philadelphia, Pa.

MOTORCYCLES

AMERICAN Motor Co., Brockton, Mass.

ANTONY Motor & Mfg. Co., Colorado Springs, Colo.

ARMAC Motor Co., 472-478 Carroll Ave., Chicago, Ill.

AURORA Automatic Machinery Co., Aurora, Ill.

BRADLEY Motor Co., C. E., 268 Diamond St., Philadelphia, Pa.

BROWN & Beck, Denver, Colo.

BUCKEYE Motor Co., 201 So. High St., Columbus, O.

CONSOLIDATED Mfg. Co., Toledo, O.

CROUCH Motor Co., Stoneham, Mass.

CURTISS Mfg. Co., G. H., Hammondsport, N. Y.

DRIVER, Walter, 700 West Lehigh Ave., Philadelphia, Pa.

DUSENBERG, A. S., Garner, Iowa.

FOWLER-Manson-Sherman Cycle Mfg. Co., 45-47 Fulton St., Chicago, Ill.

GERR Co., Harry R., St. Louis, Mo.

GREAT Western Mfg. Co., La Porte, Ind.

HARLEY-Davidson Motor Co., 315 39th St., Milwaukee, Wis.

HENDEE Mfg. Co., Springfield, Mass.

HOFFMAN Launch & Motor Works, W., 1253 N. Halsted St., Chicago, Ill.

HORNECKER Motor Mfg. Co., Whiting, Ind.

HUDSON Mfg. Co., Hudson, Mich.

ILLINOIS Motor Works, 719-23 Sheffield Ave., Chicago, Ill.

LEADER Automobile Co. (The), 2442 Lisbon Ave., Milwaukee, Wis.

MAYO Damper Co., 255 Walnut St., Pottstown, Pa.

MEADOWBROOK Cycle Co., 137-141 Jackson St., Hempstead, L. I., N. Y.

MERKEL Motor Co., Milwaukee, Wis.

METZ, C. H., Waltham, Mass.

MIAMI Cycle & Mfg. Co., Grand Ave., Middletown, O.

MITCHELL Motor Car Co., Racine, Wis.

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PHILLIPS & Hamilton, Bradford, Pa.

PIONEER Motor Cycle Co., 290 Grove St. Jersey City, N. J.

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POPE Mfg. Co., 907 Rector Bldg., Chicago, Ill.

PROSPECT Motor Mfg. Co., 7-9 Park Place, Brooklyn, N. Y.

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ROYAL Motor Works, 30 Russell St., Worcester, Mass.

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BADGER Brass Mfg. Co., Kenosha, Wis.

BRIDGEPORT Brass Co., Bridgeport, Conn.

BROWN Mfg. Co., J. B., Columbus, O.

DIETZ Co., R. E., 33 Laight St., New York.

ECO Mfg. Co., 53 State St., Boston, Mass.

EDMUNDS & Jones Mfg. Co., 315 Riopelle St., Detroit, Mich.

GRAY & Davis, Amesbury, Mass.

GRAY & Sons, Peter, 90 Union St., Boston, Mass.

HAUCK-Seebach Co., 291-295 Essex St., Brooklyn, N. Y.

HINE-Watt Mfg. Co., 60 Wabash Ave., Chicago, Ill. (see page 201).

KIMBALL Co., E. T., Motor Mart, Boston, Mass.

MANHATTAN Brass Co., 328 E. 28th St., New York City.

MANHATTAN Lamp Works, 530 W. 28th St., New York City (see page 97).

MOORE & Son Co., M. E., Westfield, Mass.

PINKUS, Frederick B., 103 Franklin St., New York.

PYLE Mfg. Co., 2211 Park Ave., Indianapolis, Ind.

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa.

RUSHMORE Dynamo Works, Plainfield, N. J.

SCOVILLE & Peck Co., New Haven, Conn.

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TWENTIETH Century Mfg. Co., 17 Warren St., N. Y. City.

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COMMERCIAL Acetylene Co., 80 Broadway, New York City.

OLD Colony Light Co., Motor Mart, Boston, Mass.

PREST-O-Lite Co., 1904 Broadway, N. Y. City (see page 165).

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ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page 51).

ALUMINUM Foundry Co., Manitowoc, Wis.

BRIDGEPORT Deoxidized Bronze & Metal Co., Bridgeport, Conn.

BUCKEYE Iron & Brass Works, 324 E. Third St., Dayton, O.

CLUM & Atkinson, Rochester, N. Y.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

ENTERPRISE Foundry Co., Detroit, Mich.

GERSON-Carey Co., Lansing, Mich.

IMPERIAL Brass Mfg. Co., 257 S. Clinton St., Chicago, Ill.

KEYSTONE Brass Foundry Co., 188 Berks St., Philadelphia, Pa.

LIGHT Mfg. & Fdry. Co., Union and Queen Sts., Pottstown, Pa. (see page 57).

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 101).

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PITTSBURG Reduction Co., Pittsburg, Pa.

SYRACUSE Aluminum & Bronze Co., 530 Leavenworth Ave., Syracuse, N. Y. (see pages 27 and 53).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 101).

UNITED States Aluminum Co., Pittsburg, Pa.

U. S. ALUMINUM Casting Co. (The), Cincinnati, O.

U. S. BRONZE Co., Cleveland, O.

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

ALUMINUM CASTINGS (See Castings, Aluminum)

ALUMINUM SOLDER

GROUT Bros. Automobile Co., Orange, Mass.

LESTER Co., E. F., Fayetteville, N. Y.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

SOLDERENE Company, 53 State St., Boston, Mass.

AMMETERS AND VOLTMETERS

AMERICAN Coil Co., Inc., Foxboro, Mass.

AMERICAN Electrical Novelty & Mfg. Co., 308 Hudson St., New York.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealer and Jobber) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page opposite).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

CONN. Telephone & Electric Co., Meriden, Conn.

DOW Portable Elec. Co., Braintree, Mass.

ELDREDGE Electric Mfg. Co., 7 Post Office Square, Springfield, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404 and 1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

GEEN Electrical Mfg. Co., Inc., 183 E. Lake St., Chicago, Ill.

GENERAL Electric Co., Schenectady, N. Y.

KENT Mfg. Co., Atwater, 50 N. 6th St., Philadelphia, Pa. (see page opposite).

KEYSTONE Electrical Instrument Co., 9th St. and Montgomery Ave., Philadelphia, Pa.

MONARCH Instrument Co. (The), Cleveland, O.

MORE-Power Co., 619 Gorham St., Lowell, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NATIONAL Carbon Co., Cleveland, O. (see page 197).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

NORTON Electrical Instrument Co., Manchester, Conn.

PIGNOLET, Louis M., 78 Cortlandt St., New York, N. Y.

POCKET Meter Co., Bluffton, O.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co., Hartford, Conn. (Importers) (see page 127).

QUEEN & Co., Inc., 8th and Arch Sts., Philadelphia, Pa.

ROBERT Instrument Co. (The), 49 Shelby St., Detroit, Mich. (see page opposite).

RUBAY, Leon, 136 West 38th St., New York City (Importer).

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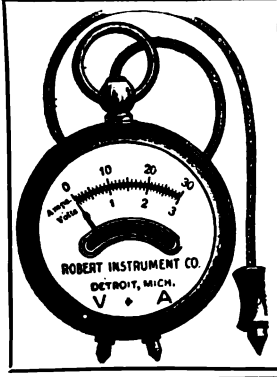

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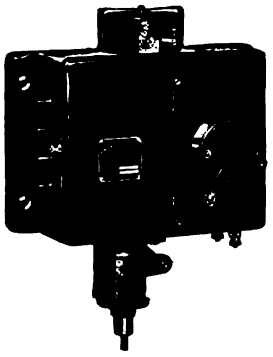

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YOUNG, O. W., Newark, N. J.

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BAILEY & Co., C. J., 22 Boylston St., Boston, Mass.

BROWN Mfg. Co., J. C., Butler, Ind.

DAVEY Tire Guard Co. (The), 399 Franklin St., Buffalo, N. Y.

HEALY Leather Tire Co., 88 Gold St., N. Y. City.

JOHNSON Sporting Goods Co., Iver, 163-165 Washington St., Boston, Mass.

LEATHER Tire Goods Co., Newton, Upper Falls, Mass. (see page opposite).

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SAGER Co., J. H., Rochester, N. Y.

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TIRE Protection Co. (The), 83 Chambers St., New York.

WEED Chain Tire Grip Co., 28 Moore St., N. Y. City.

WELLS Light Mfg. Co. (The), 44-46 Washington St., N. Y. City.

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AUTO Top Co., Fort Wayne, Ind. (see page 171).

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GILBERT Mfg. Co., New Haven, Conn. (see page 163).

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RACINE Novelty Mfg. Co., 600 6th St., Racine, Wis.

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VEHICLE Top and Supply Co. (The), 900 Cass St., St. Louis, Mo. (see page 135).

WARNER Pole & Top Co., 1655 Central Ave., Cincinnati, O.

WILEY & Son Co., Wm. H., Hartford, Conn. (see page 165).

WOOD & Son, Fred'k R., 219 W. 19th St., New York City.

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DIRECT Drive Axle Co. (The), 575 N. 4th St., Columbus, O.

FEDERAL Auto Co., First Nat'l Bank Bldg., Chicago, Ill.

FUNK Engineering Co., 39 14th St., Hoboken, N. J.

GARFORD Co. (The), Elyria, O.

GILL & Sons Forge & Machine Works, P. H., Brooklyn, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

LEE & Porter Mfg. Co., Buchanan, Mich.

LONG Arm System Co., Cleveland, O.

MOFFETT Vehicle Bearing Co., Saginaw, W. S., Mich.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 41).

NORTHWAY Motor & Mfg. Co., Maybury Grand Ave., Detroit, Mich.

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y. (see page 189).

SMITH Co., A. O., Milwaukee, Wis.

STANDARD Ball Axle Co., Lancaster, Pa.

STANDARD Roller Bearing Co., 48th St. and Girard Ave., Philadelphia, Pa.

TIMKEN Roller Bearing Axle Co., Canton, O.

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WESTON-Mott Co., Flint, Mich.

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AMERICAN Ball Bearing Co., Cleveland, O.

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EXCELSIOR Machine Co., Military Road, Buffalo, N. Y.

JONES & Co., E. J., Arlington Heights, Mass.

STANDARD Roller Bearing Co., Philadelphia, Pa.

BALL RETAINERS

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 151).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

SARTUS Ball Bearing Co., 155 Spring St., N. Y. City.

STAR BALL Retainer Co., Lancaster, Pa.

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JACKSON Mfg. Co., 614 17th St., Denver, Colo.

MULLINS Co., The W. H., Salem, O.

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

BATTERY CONNECTIONS (See Wire Terminals)

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AMERICAN Electrical Novelty & Mfg. Co., 308 Hudson St., N. Y. City.

CENTRAL Electric Mfg. Co., 1525 Second Ave., Rock Island, Ill.

CONN. Telephone & Electric Co., Meriden, Conn.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 105).

DELTA Mfg. Co., Bloomfield, N. J.

DOW Portable Electric Co. (The), Braintree, Mass.

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H. & H. Dry Battery Co., 754 Michigan St., South Bend, Ind.

LINCOLN Electric Co., 1-3 Union Sq., New York.

MANHATTAN Electrical Supply Co., 17 Park Place, New York.

NATIONAL Carbon Co., Cleveland, O. (see page 197).

NOVELTY Electric Co., Philadelphia, Pa.

NUNGESSER Electric Battery Co. (The), 21 King St., Cleveland, O.

ROCHE, Wm., 40 W. Broadway, N. Y. City.

ROCK Island Battery Co., Cincinnati, O.

ROYAL Battery Co., 143 Chambers St., N. Y. City (see page 7).

SEMI-DRY Battery Co. (The), 5th and Essex Sts., Harrison, N. J.

STACKPOLE Battery Co., St. Marys, Pa.

U. S. Battery Co., New Rochelle, N. Y.

WESCO Supply Co. (The), 7th St. and Clark Ave., St. Louis, Mo.

WILHELM Battery Co., The H., 70-72 Frost St., Brooklyn, N. Y.

BATTERIES (Storage)

AMERICAN Battery Co., 172 South Clinton St., Chicago, Ill.

BATTERY Power Co., 247-253 Madison St., Milwaukee, Wis.

CHICAGO Battery Co., Michigan Ave. and 14th St., Chicago, Ill. (see page 115).

CLARK, A. F. & Co., 2130 W. Susquehanna Ave., Philadelphia, Pa.

COLUMBUS Storage Battery Co., Columbus, Ohio.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 105).

DAYTON Mfg. Co., 2240 E. 3d St., Dayton, O.

DELTA Mfg. Co., Bloomfield, N. J.

EDISON Storage Battery Co., Orange, N. J.

ELECTRIC Storage Battery Co. (The), Allegheny Ave. and 19th St., Philadelphia, Pa.

ELECTRIC Vehicle & Supply Co., 621 Grand Ave., Milwaukee, Wis.

EMPIRE Storage Battery Co., 42 E. 23d St., N. Y. City.

EVANSVILLE Battery & Electrical Co., Evansville, Ind.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

G. & C. Dry Battery Mfg. Co., 57 W. 3d St., N. Y. City.

GENERAL Accumulator & Battery Co., 152 2d St., Milwaukee, Wis. (see page 211).

GOULD Storage Battery Co., 25 West 33d St., N. Y. City.

HASCHKE Compound Storage Battery Co., 89 Ashland Blvd., Chicago, Ill.

HATCH Accumulator Co., Charlestown, Boston, Mass.

HELIOS Mfg. Co., Bridesburg, Pa.

HERZ & Co., 203-205 Lafayette St., New York (Importers).

KITSEE Storage Battery Co. (The), Wilkes-Barre, Pa.

LOOK Electric Co. (The), 1545 Michigan Ave., Chicago, Ill.

MACRAE, Hector, 316 St. Paul St., Baltimore, Md.

MICHIGAN Storage Battery Co., 24 Atwater St., E., Detroit, Mich.

NATIONAL Battery Co., 268-282 Massachusetts Ave., Buffalo, N. Y.

NATIONAL Motor Vehicle Co., Indianapolis, Ind.

NEW England Motor Co. (The), Liberty Square, Lowell, Mass. (see page opposite).

NORTHWESTERN Storage Battery Co., Stephenson Bldg., Milwaukee, Wis.

PERRETT Storage Battery Co., 17 State St., N. Y. City.

PHILADELPHIA Storage Battery Co., Emerald and Tioga Sts., Philadelphia, Pa.

PILE Bloc Co., 253 B'way, New York.

ROYAL Battery Co., 143 Chambers St., N. Y. City (see page 7).

RUBAY, Leon, 136 West 38th St., N. Y. City (Importer).

RUPRECHT Electrical Co., 769 Cedar Ave., Cleveland, O.

SMITH Storage Battery Co., 198 State St., Binghamton, N. Y.

STORAGE Battery Supply Co., 239 East 27th St., N. Y. City.

TOLEDO Storage Battery Co., 102 Ottawa St., Toledo, O.

TRAY Plate Battery Co. (The), 5 Frederick St., Binghamton, N. Y.

U. S. Battery Co. (The), New Rochelle, N. Y.

UNIVERSAL Elec. Storage Battery Co., Stock Exchange Bldg., Chicago, Ill.

VESTA Accumulator Co., 1334 Michigan Ave., Chicago, Ill.

VIVAX Storage Battery Co., 2228 Michigan Ave., Chicago, Ill. (see page opposite).

WESTERN Storage Battery Co., Indianapolis, Ind.

WILLARD Storage Battery Co. (The), Cleveland, O.

WITHERBEE Igniter Co., 541 West 43d St., N. Y. City (see page 33).

WITHERBEE Mfg. Co., 433 W. 42d St., New York.

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WESTERN INSTRUMENT COMPANY,
Per THOS. A. ANDERSON, President and Treasurer.

Vivax Storage Battery Co., 2224 to 2234 Michigan Ave. Chicago, Ill., Sep. 14, 1906

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Yours very truly,
MAXWELL-BRISCOE MOTOR CO., per W. B. Jameson, Supt.

VIVAX STORAGE BATTERY COMPANY, 2228 Michigan Avenue CHICAGO, ILL.

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BEARINGS (Ball)

AMERICAN Ball Co., Providence, R. I.

AMERICAN Ball Bearing Co., Cleveland, O.

AUBURN Ball Bearing Co., Rochester, N. Y.

BANTAM Anti-Friction Co., Bantam, Conn.

BRETZ Co., J. S. (Importer), Times Bldg., N. Y. City.

CHAPMAN Double Ball Bearing Co., Sudbury St., Boston, Mass.

HESS-Bright Mfg. Co., 245 N. Broad St., Philadelphia, Pa.

PENNSYLVANIA Ball & Roller Bearing Co., Girard, Pa.

PRESSED Steel Mfg. Co., 454 The Bourse, Philadelphia, Pa.

RUBAY, Leon (Importer), 140 West 38th St., N. Y. City.

SARTUS Ball Bearing Co., 155 Spring St., N. Y. City.

STANDARD Roller Bearing Co., 48th St. and Girard Ave., Philadelphia, Pa.

STAR Ball Bearing Axle Co., Princeton, Ill.

WORCESTER Pressed Steel Co., Worcester, Mass.

BEARINGS (Roller)

AMERICAN Roller Bearing Co., South Framingham, Mass.

HYATT Roller Bearing Co., 427 Middlesex St., Harrison, N. J.

MOFFETT Vehicle Bearing Co., 922 S. Niagara St., Saginaw, Mich.

PENNSYLVANIA Ball & Roller Bearing Co., Girard, Pa.

STANDARD Roller Bearing Co., Girard Ave. and 48th St., Philadelphia, Pa.

TIMKEN Roller Bearing Axle Co., Canton, Ohio.

BELLS

ANSONIA Electrical Co., Ansonia, Conn.

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 45).

BEVIN Bros. Mfg. Co., East Hampton, Conn.

BRIDGEPORT Brass Co., Bridgeport, Conn.

COLE & Son, Rockford, Ill.

EAST Hampton Bell Co. (The), East Hampton, Conn.

EDWARDS & Co., 405 E. 144th St., N. Y. City.

GONG Bell Mfg. Co., East Hampton, Conn.

HILL, N. N., Brass Co., East Hampton, Conn.

HOLTZER-Cabot Electric Co., Brookline, Mass.

LIBERTY Bell Co., Bristol, Conn.

MANHATTAN Electrical Supply Co., 17 Park Pl., New York.

MOSSBERG, Frank, Co., Attleboro, Mass.

NEW Departure Mfg. Co., Bristol, Conn.

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

PROCTOR-Raymond Mfg. Co., Detroit, Mich.

BELTING (Leather)

REPUBLIC Belting & Supply Co., Cleveland, Ohio.

BODIES (Wood and Metallic)

ABRESCH Co., Charles, 398 4th St., Milwaukee, Wis.

AMERICAN Veneer Co., 666 Market St., Kentwood, N. J. (see page 15).

AMESBURY Metal Body Co., Amesbury, Mass.

ARMSTRONG, M., & Co., 433 Chapel St., New Haven, Conn.

AUTO Body Co. (The), Franklin Ave., Lansing, Mich.

AUTO Body & Finishing Co., Amesbury, Mass.

BABCOCK Co., H. H., Watertown, N. Y.

BARNDT-Johnston Auto Supply Co. (The), 422 Donaldson St., Columbus, O. (see page opposite).

BIDDLE & Smart Co., Amesbury, Mass. (see page 11).

BLUE Ribbon Horse & Carriage Co., 130-170 Cannon St., Bridgeport, Conn.

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 119).

BORCHERS Tonneau Mfg. Co., Dayton, O.

BRIDGEPORT Vehicle Co., Bridgeport, Conn.

BRIGGS Carriage Co., Amesbury, Mass.

BROC Carriage & Wagon Co., 1665-67 40th St., N. E., Cleveland, O.

BRUNN'S Carriage Manufactory, 1140 Main St., Buffalo, N. Y.

BUCKEYE Carriage Body Co., Bellefontaine, Ohio.

BUOB & Scheu, 408 E. Court St., Cincinnati, Ohio.

CARLISLE Body & Gear Wks., Carlisle, Pa.

CARRIAGE Woodstock Co., Owensboro, Ky.

CENTRAL Mfg. Co., Connersville, Ind.

CHICAGO Coach & Carriage Co., 1223 Michigan Ave., Chicago, Ill.

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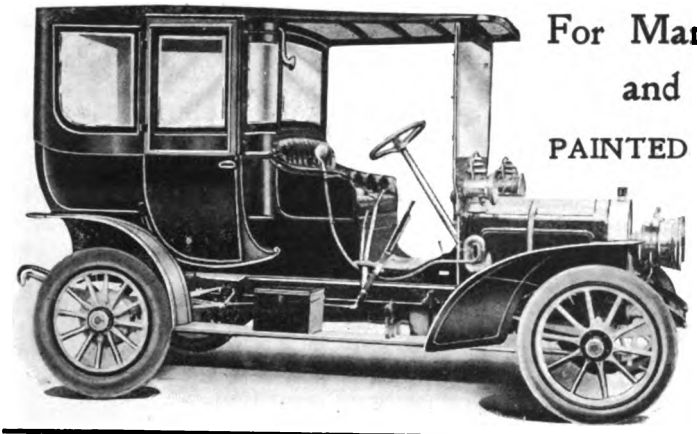

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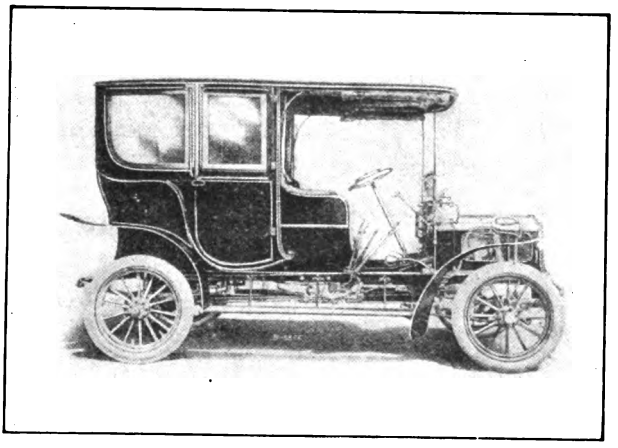

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CONNOLLY Carriage Works, Thomas, 7th and Iowa Sts., Dubuque, Ia.

CRAWFORD, G. W. & H. D., Delhi, N. Y.

CURRIER-Cameron Co. (The), 85 Elm St., Amesbury, Mass.

DANN Bros. & Co. (The), 80-88 Franklin St., New Haven, Conn.

DEMOREST, A. L., New Haven, Conn.

DETROIT Carriage Co., Detroit, Mich.

DETROIT Motor Car Supply Co., 1250 Jefferson Ave., Detroit, Mich.

DUNHAM & Son, D. B., Rahway, N. J.

EMOND, J. P. & W. H., 474 Parker St., Boston, Mass.

EMPIRE Gear & Top Co., 53 Mechanic St., Newark, N. J.

FICKLING & Co., Inc., 154 E. 57th St., New York City.

FITZ-GIBBON & Crisp Carriage & Auto Body Co., Trenton, N. J.

FRANZ Body Mfg. Co. (The), Akron, O.

GOOLD, James Co., Albany, N. Y.

GRAVES & Congdon Co., Amesbury, Mass.

HAVENS Co. (The), Kokomo, Ind.

HAYES Mfg. Co., 360-370 Maybury Ave., Detroit, Mich. (see page 43).

HILL Mfg. Co., 25 Fuller St., Buffalo, N. Y.

HOLCOMB, H. C., 105 Goffe St., New Haven, Conn.

HORTON, H. A., 127-131 Park St., New Haven, Conn.

HOWARTH & Rogers, Amesbury, Mass.

HUME Carriage Co., Amesbury, Mass. (see page opposite).

KARBACH Automobile & Vehicle Co., Omaha, Neb.

KEYSTONE Wagon Wks. Co., Reading, Pa.

KILLAM, Henry, Chestnut and Wooster Sts., New Haven, Conn.

KIMBALL & Co., C. P., 315 Michigan Ave., Chicago, Ill. (see page opposite).

KOEN, James R., 1257 Niagara St., Buffalo, N. Y.

KUNDTZ, Theo., Cleveland, O.

LANE, T. W., Amesbury, Mass.

LAPORTE Carriage Co., Laporte, Ind.

LAWRENCE & Co., L., Newark, N. J.

LEITCH Mfg. Co., Amesbury, Mass.

LOCKE & Co., 218 W. 84th St., N. Y. City.

MIDDLETOWN Auto Body Co., Middletown, Conn.

MILLER & Co., A. J., Bellefontaine, O.

MILLER Bros., Amesbury, Mass.

MINOGUE Body & Seat Co., Kansas City, Mo.

MOORE & Munger Co., 602 W. 52d St. New York.

MOTOR Top Co. of N. Y., 216 W. 50th St., New York.

MULLINS Co., The W. H., Salem, O.

NEW HAVEN Carriage Co., New Haven, Conn. (see page 37).

NEWTON, W. H., & Son, 127 Elm St., Cortlandt, N. Y.

NICHOLS & Co., D. P., 116-122 W. Brookline St., Boston, Mass.

OHIO Carriage Body Co., Bellefontaine, O.

OHIO Scroll & Lumber Co., Covington, Ky.

PEASE & Sons, S. C., Merrimac, Mass.

PEEZ & Hoffman, 3d St., near Fowler, Milwaukee, Wis.

PENN. Auto Metal Body Mfg. Co., Sinking Springs, Pa.

PETZELT & Keyser, 24th and Locust Sts., Philadelphia, Pa.

PONTIAC Body Co., Pontiac, Mich.

QUINBY, J. M. & Co., Newark, N. J.

QUINSLER & Co., 26-30 Cambria St., Boston, Mass.

RACINE Novelty Mfg. Co., 600 6th St., Racine, Wis.

RANDS Mfg. Co., Detroit, Mich.

READING Metal Body Co., Reading, Pa.

RECH, Jacob & Sons, 8th St. and Girard Ave., Philadelphia, Pa.

RITTER Mfg. Co., 242 Jefferson Ave., Detroit, Mich.

ROBBINS & Co., Irwin, 32 E. Georgia St., Indianapolis, Ind.

SAFETY Buggy Co., Lancaster, Pa.

SCHUBERT Bros. Gear Co., Oneida, N. Y.

SCHURMEIER Wagon Co., 29 Western Ave., Minneapolis, Minn.

SEABROOK & Smith Carriage Co., 126 Park St., New Haven, Conn.

SHIELDS Carriage Co. (The), Amesbury, Mass.

SPRINGFIELD Metal Body Co., 387 Birnie Ave., Brightwood, Mass. (see page 169).

STEWART, W. F., Co. (The), Flint, Mich.

STIVERS, R. M., 19 W. 62d St., New York.

STONE & Sons, C., 167-177 Ogden Ave., Chicago, Ill.

STRATTON Carriage Body Co., Muncie, Ind.

STUDEBAKER Bros. Mfg. Co., 378 Wabash Ave., Chicago, Ill.

TERRE Haute Carriage & Body Co., 101 Wabash Ave., Terre Haute, Ind.

UNION City Body Co., Union City, Ind.

WALKER Carriage Co., Merrimac, Mass.

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BODIES (Wood and Metallic) (Continued)

WILCOX, M. E., Providence, R. I.

WILLOUGHBY Co., 86 Genesee St., Utica, N. Y.

WILSON, C. R., Body Co., Detroit, Mich.

WOGAMAN, J. Webster, Union City, Ind.

WOOD, A. M., 51 Beverly St., Boston, Mass.

WRIGHT Carriage Body Co., Moline, Ill.

YORK Wagon & Gear Co., York, Pa.

YOUNG Carriage Co., Wm., 4524 Delmar Ave., St. Louis, Mo.

BODY IRONS

AUTO Top Co., Fort Wayne, Ind. (see page 171).

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SHIELDS Carriage Co., Amesbury, Mass.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 175).

BOILERS

AMERICAN Boiler Co., 85 N. Kedzie Ave., Chicago, Ill.

BIGELOW Co. (The), New Haven, Conn.

FORG, Peter, Park St., Somerville, Mass.

FRANTZ Auto Co., Cherryville, Pa.

HOLMES, J., & Co., 518 Broad St., Newark, N. J.

KILBURN, Edwin, Spring Valley, Minn.

KNAPP Mfg. Co., 2529 Polk St., N. E., Minneapolis, Minn.

LOCKE Regulator Co., Salem, Mass.

MILNE, Frank, Everett, Mass.

OFELDT & Sons, August, 123 Liberty St., N. Y. City.

OFELDT & Sons, F. W., Nyack-on-the-Hudson, N. Y.

PORTLAND Garage Co., Portland, Me.

ROCHESTER Machine Tool Wks., Rochester, N. Y.

SCHAFFER Machine Mfg. Co. (The), 211 N. Calvert St., Baltimore, Md.

STEAM Carriage Boiler Co., 119 W. First St., Oswego, N. Y.

THROOP Perforating Co., 80 Terrace, Buffalo, N. Y.

TONKIN Boiler Co., Oswego, N. Y.

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

BOILER SHELLS

(See Shells: Boiler, Steel)

(and Shells: Boiler, Copper)

BOILER TUBE EXPANDERS

(See Tube Expanders)

BOLTS AND NUTS

AMERICAN Iron & Steel Mfg. Co., Lebanon, Pa.

ATLAS Bolt & Screw Co. (The), Cleveland, Ohio.

BLAKE & Johnson, Waterbury, Conn.

CHICAGO Screw Co., 2 N. Canal St., Chicago, Ill.

CLARK Bros. & Co., Milldale, Conn.

COLUMBIA Nut & Bolt Co., Inc., Bridgeport, Conn.

COLUMBUS Bolt Wks., 162 W. Randolph St., Columbus, O.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 43).

DETROIT Screw Works, Detroit, Mich.

FRANKLIN Moore Co., Winsted, Conn.

HARTFORD Machine Screw Co., 476 Capitol Ave., Hartford, Conn.

KIRK-Latty Co., Cleveland, O.

LAMSON & Sessions Co., 412-453 Scranton Ave., Cleveland, O.

NATIONAL Screw & Tack Co., Cleveland, O.

PENINSULAR Milled Screw Co., 751 Bellevue Ave., Detroit, Mich.

PROGRESSIVE Mfg. Co., Torrington, Conn.

REPUBLIC Iron and Steel Co., Stock Exch. Bldg., Chicago, Ill.

RUSSELL, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 175).

UPSON Nut Co., Unionville, Conn.

WORCESTER Machine Screw Co., Worces-
Elyria, O.

WESTERN Automatic Machine Screw Co.,
ter, Mass.

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BOWS (Top)

BEECHER, Walter N., 325 E. 25th St., Chicago, Ill.

BROWN & Co., S. N., Dayton, O.

DANN Bros. & Co., 80-88 Franklin St., New Haven, Conn.

HARPER Co., Walter J., 229 Mulberry St., Newark, N. J.

SPRAGUE Umbrella Co., Norwalk, O. (see page 67).

UNION Bow Co., 421 Superior St., Cleveland, Ohio.

BOW SOCKETS

ASHTABULA Carriage Bow Co., 99 Prospect St., Ashtabula, O.

BROWN & Co., S. N., Dayton, Ohio.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page opposite).

CORTLAND Carriage Goods Co., Cortland, N. Y.

CORTLAND Forging Co., Cortland, N. Y. (see page opposite).

CRANDALL, Stone & Co., Binghamton, N. Y.

LIMOUSINE Carriage Mfg. Co., Chicago, Ill.

METAL Stamping Co., 243 West St., New York, N. Y.

RANDS Mfg. Co., Detroit, Mich.

ROEHM & Davison, Ltd., Detroit, Mich.

SCHERER & Co., H., Detroit, Mich.

BOXES (Spark Coil)

AUTO Body Co., Lansing, Mich.

CHURCHILL Cabinet Co., 72 Churchill St., Chicago, Ill.

KUNDTZ, Theo., Cleveland, O.

MURRAY, W. F., 28 Beach St., Boston, Mass.

WEST Box Co., F. M., 225 Liberty St., Springfield, Mass.

BOXES (Tool)

AMERICAN Steel Barrel Co., 204-206 Varet St., Brooklyn, N. Y.

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 45).

A-Z Co., 527 West 56th St., N. Y. City.

BRISCOE Mfg. Co., Detroit, Mich. (see page 133).

HAYES Mfg. Co. (The), 360-370 Maybury Ave., Detroit, Mich. (see page opposite).

MASON, John A., Newton, Mass.

MOTOR Car Supply Co. (The), Michigan Ave., Chicago, Ill. (see page 87).

TEEL Mfg. Co., Medford, Mass.

BRAKES

GABRIEL Horn Mfg. Co., Cleveland, O.

GARAGE Equipment Co., Milwaukee, Wis.

GARFORD Co. (The), Elyria, O.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

KALISCH Air Brake Co., 1317 Chestnut St., St. Louis, Mo.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LONG Arm System Co., Cleveland, O.

MALTBY Automobile & Mfg. Co., Brooklyn, N. Y.

MOON Brake Co., Third and Porter Sts., Detroit, Mich.

N. J. Automobile Co., 226-230 Halsey St., Newark, N. J.

PORTLAND Garage Co., Portland, Me.

READING Automobile Co., 26 S. 5th St., Reading, Pa.

ROYAL Equipment Co., 165 Housatonic St., Bridgeport, Conn.

SMITH Co., A. O., Milwaukee, Wis.

WATRES Mfg. Co., 1135 Broadway, N. Y. City.

WHIPPLE, R. W., Binghamton, N. Y.

YOUSE, E. S., Reading, Pa.

BRAKE BANDS

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page 51).

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 45).

CALDWELL Co. (The), 136 S. 14th St., Philadelphia, Pa.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

NIAGARA Falls Brass Works, Inc., Niagara and Virginia Sts., Buffalo, N. Y. (see page 55).

ROSSENDALE-Reddeway Belting & Hose Co., Newark, N. J.

SYRACUSE Aluminum & Bronze Co., Syracuse, N. Y. (see pages 27 and 53).

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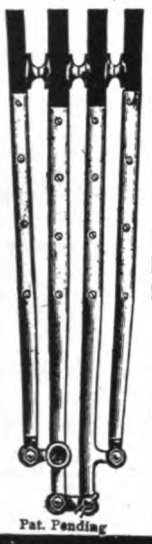
TOP FIXTURES



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AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page opposite).

CROSBY Co. (The), Buffalo, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

HYDRAULIC Pressed Steel Co., Cleveland, O. (see back cover).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

WORCESTER Pressed Steel Co., Worcester, Mass.

BRAKE LOCKS

GARAGE Equipment Co., Milwaukee, Wis.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

TURNER Brass Co., 72 Michigan St., Chicago, Ill. (see page 79).

BRASS AND COPPER (Sheet and Rod)

ANSONIA Brass & Copper Co., New York, N. Y.

BRIDGEPORT Brass Co., New York, N. Y.

COE Brass Mfg. Co., Torrington, Conn.

DETROIT Copper & Brass Rolling Mills, Detroit, Mich.

HENDRICKS Bros., New York, N. Y.

HOLMES, Booth & Haydens Co., Waterbury, Conn.

HUSSEY & Co., C. G., Pittsburg, Pa.

MANHATTAN Brass Co., New York, N. Y.

NEW HAVEN Copper Co., Seymour, Conn.

PLUME & Atwood Mfg. Co., Waterbury, Conn.

RANDOLPH-Clowes Co., Waterbury, Conn.

ROME Brass & Copper Co., Rome, N. Y.

SCOVILL Mfg. Co., Waterbury, Conn.

SEYMOUR Mfg. Co., Seymour, Conn.

TAUNTON-New Bedford Copper Co., Taunton, Mass.

WATERBURY Brass Co., Waterbury, Conn.

BRAZIERS

A-Z Co. (The), 527 West 56th St., N. Y. City.

BUFFALO Dental Mfg. Co., 587-589 Main St., Buffalo, N. Y.

CAST Iron Brazing & Mfg. Co., Manchester, N. H. (see page opposite).

CLAYTON & Lambert Mfg. Co., Detroit, Mich.

ENTERPRISE Machine Works, 308 N. 5th St., Richmond, Va.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

INVINCIBLE Mfg. Co., Wilmington, Ill.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

NATIONAL Cement & Rubber Mfg. Co., 3053 Monroe St., Toledo, O.

REECE, J. A., 716 A St., N. W., Washington, D. C.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WHITE Mfg. Co., 72 So. Canal St., Chicago, Ill.

BRAZING COMPOUND

A. & J. Mfg. Co., 26 W. Randolph St, Chicago, Ill.

CAST Iron Brazing & Mfg. Co., Manchester, N. H. (see page opposite).

CORTLAND Specialty Co., 176 Railroad St., Cortland, N. Y.

DINGEE, M. H., Lynchburg, Va.

DIXON, Jos., Crucible Co., Jersey City, N. J.

FRANKLIN Moore Co., Winsted, Conn.

KREMBS & Co., 55 Waldo Pl., Chicago, Ill.

NATIONAL Cement & Rubber Mfg. Co., 3053 Monroe St., Toledo, O.

STANDARD Brazing Co., 88 Broad St., Boston, Mass.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WATERBURY Brass Co., Waterbury, Conn.

BRUSHES (Carbon)

NATIONAL Carbon Co., Cleveland, O. (see page 197).

BUCKETS (Collapsible)

ABERCROMBIE & Fitch, 316 B'way, N. Y. City.

BOYLE & Co., John, 112-114 Duane St., New York City.

DUPLEX Folding Pail Co., 420 West 14th St., New York City.

GOODRICH, B. F., Co., Akron, O.

GUTTA Percha & Rubber Mfg. Co., New York, N. Y.

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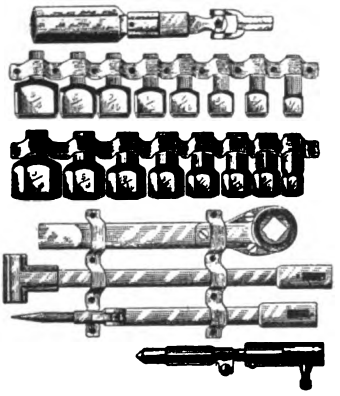

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HODGMAN Rubber Co., New York, N. Y.

KNOWLES, C. S., 7 Arch St., Boston, Mass.

RUE Mfg. Co., 215 Race St., Philadelphia, Pa.

WATERBURY Brass Co., Waterbury, Conn.

BUFFING MACHINES

COATES Clipper Mfg. Co., Worcester, Mass. (see page opposite).

BUMPERS

APPLIANCE Mfg. Co., 70-86 West Jackson Blvd., Chicago, Ill. (see page 189).

CALUMET Tire & Rubber Co., 43d and Wabonsia Aves., Chicago, Ill.

HARTFORD Rubber Wks. Co., Hartford, Conn. (see page 161).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

BURNERS (Gasoline and Kerosene)

AMERICAN Burner Co., 81 No. Kedzie Ave., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FORG, Peter, Park St., Somerville, Mass.

FRANZ Mfg. Co., Cherryville, Pa.

LIQUID Fuel Engineering Co., Bridgeport, Conn.

LYNN Auto. Co., 274 Broad St., Lynn, Mass.

LOCKE Regulator Co., Salem, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NATIONAL Equipment Co., Holland Bldg., St. Louis, Mo.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

OFELDT & Sons, August, 123 Liberty St., New York.

OFELDT & Sons, F. W., Nyack-on-the-Hudson, N. Y.

PEDERSEN Mfg. Co., 400-412 East 37th St., N. Y. City (see page 103).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

STEAM Carriage Boiler Co., 119 West First St., Oswego, N. Y.

TAUNTON Motor Carriage Co., Taunton, Mass.

TONKIN Boiler Co., Oswego, N. Y.

TRIUMPH Mfg. Co., Nashville, Tenn.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WALKER Co., E. C., 1913-1923 Logan St., Louisville, Ky.

BURNERS (Gas Lamp)

ACETYLENE Gas Ill. Co., 105 Walker St., New York, N. Y.

AMERICAN Lava Co., Chattanooga, Tenn.

CARROLL, J. B., 136 Lake St., Chicago, Ill.

CRANE Co., W. N., 1131-1133 Broadway, N. Y. City.

KIRCHBERGER & Co., 50 Warren St., New York City.

PREST-O-LITE Co. (The), 1904 Broadway, N. Y. City (see page 165).

STAR Acetylene Gas Burner Co., Chattanooga, Tenn.

STATE Line Talc. Co., Chattanooga, Tenn.

STEWART, D. M., Mfg. Co., of Canada, 151 King St., W., Toronto.

CANOPIES (See Tops)

CANS (See Oil Cans)

CANS (Waste)

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 133).

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

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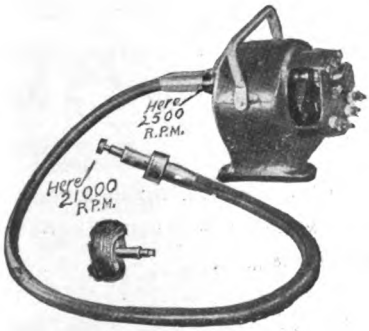

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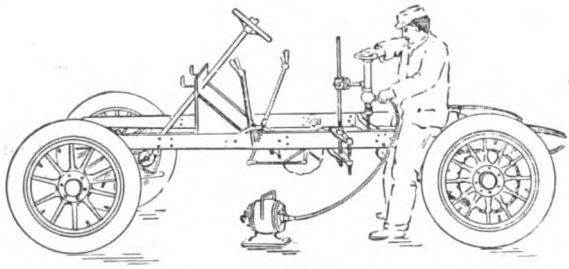

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CAPS (Auto)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

DEMMERLE & Co., 248 W. 23d St., New York City.

DETROIT Cap Mfg. Co., 11-17 Woodbridge St., W., Detroit, Mich.

DINNER, Isaac H., Co., 78 Bedford St., Boston, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

KIBBE, C. S., Batavia, N. Y.

LASKY & Levy, 20 and 22 Waverly Place, New York City.

LILLEY Co., M. C., Columbus, O.

MAXFIELD & Co., Glen C., 170 E. Madison St., Chicago, Ill.

MORAWETZ Co. (The), 343 Broadway, Milwaukee, Wis.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers (see page 17).

PONTIAC Knitting Co., Pontiac, Mich.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

REVILLON Bros., 15 W. 28th St., New York City.

RIPON Knitting Wks., Ripon, Wis.

SAKS & Co., Broadway, 33d to 34th St., New York City.

SCANDINAVIAN Fur & Leather Co., New York, N. Y.

SHAW, Ora D., 109 Kingston St., Boston, Mass.

SPRINGFIELD Hat & Cap Co., 27-35 Taylor St., Springfield, Mass.

WANCKEL, Manfred, 640 Madison Ave., New York City.

CARBIDE

ACETYLENE Gas Ill. Co., 105 Walker St., New York.

ACETYVONE Co., 38 Park Row, New York City.

AMERICAN Carbolite Co., Constantine, Mich.

NEW Amsterdam Motor Co., 152 W. 56th St., New York.

UNION Carbide Co., Michigan Ave. and Adams St., Chicago, Ill.

CARBURETERS

A. & J. Mfg. Co., 26 W. Randolph St., Chicago, Ill.

ACORN Brass Mfg. Co., Chicago, Ill.

AMERICAN Carburetor Co., 907 Michigan Ave., Detroit, Mich.

ASTER Co., 1591 Broadway, N. Y. City.

AURORA Automatic Machinery Co., 421 Claim St., Aurora, Ill.

AUTO Improvement Co., 316 Hudson St., New York City.

AUTOMOBILE Parts & Equipment Co., 2228 Michigan Ave., Chicago, Ill.

AXIOM Carbureter Mfg. Co. (The), 106 E. 28th St., N. Y. City.

BAIRD-Banks Mfg. & Supply Co., 35 Warren St., N. Y. City.

BOWERS Co., Inc. (The), F. E., 307 First Nat'l Bank Bldg., New Haven, Conn.

BRADFORD Motor Works, Bradford, Pa.

BREEZE Motor Mfg. Co., 33 Court St., Newark, N. J.

BROOKLYN Coil & Carbureter Co., 77-79 Adams St., Brooklyn, N. Y.

BUFFALO Carbureter Co., Main and Carlton Sts., Buffalo, N. Y. (see page 155).

BYRNE, Kingston & Co., Kokomo, Ind.

CAMDEN Anchor-Rockland Machine Co., Rockland, Me.

CHRISTOPHER Bros., 1049 Sheffield Ave., Chicago, Ill.

CLEMICK-Hirsch Co., Milwaukee, Wis.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich. (see page 111).

CULVER Novelty Co., Culver, Ind.

DUPLEX Roller Bushing Co., Belfast, Me.

FAST, Otto, Greenfield and 25th Aves., Milwaukee, Wis.

GAITHER-Owen Co., 40 W. 60th St., N. Y. City.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

GOULD-Derby Mfg. Co., 109 N. Broad St., Trenton, N. J.

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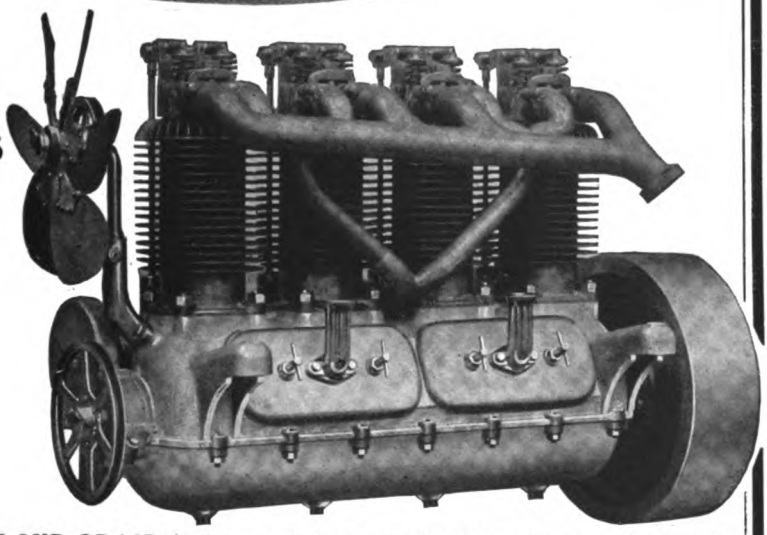

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HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

HEATH Dry Gas Co., 1623 Broadway, N. Y. City.

HOLLEY Bros., 661-673 Beaubien St., Detroit, Mich.

IMPERIAL Brass Mfg. Co., 251 So. Jefferson St., Chicago, Ill.

JOHNSTON Machine Co., 86 High St., Woodbury, N. J.

KALAMAZOO Carbureter Co., 1301 Grand Ave., Kalamazoo, Mich.

KAUFMAN, Chas., Oshkosh, Wis.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LEE Mfg. Co. (The), South Park, Port Huron, Mich.

LIPMAN Mfg. Co., Beloit, Wis.

LOOMIS Autocar Co., Westfield, Mass.

LUNKENHEIMER Co. (The), 213-223 E. 8th St., Cincinnati, O.

LUSTRE Chemical Co., 1303 Michigan Ave., Chicago, Ill.

MASSNICK Mfg. Co., 1567 River St., Detroit, Mich.

MAXWELL & Fitch Co. (The), 218 So. Washington St., Rome, N. Y.

MAYO Damper Co., 355 Walnut St., Pottstown, Pa.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 101).

MICHIGAN Brass & Fdry. Co. (The), 74-78 Fort St., E., Detroit, Mich.

MORGAN, B., 88 John St., Newport, R. I.

MUNCIE Auto Parts Co., Muncie, Ind.

NEWCOMB Carbureter Co., 1900 Broadway, N. Y. City.

NORTH Chicago Mach. Co., North Chicago, Ill.

NUTTING Machine Co., Dayton, O.

POWER, J. J., 653 E. Main St., Madison, Wis.

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill. (see page 109).

PUTNAM, R. H., 57 Lebanon St., Springfield, Mass.

RUBAY, Leon, 136 W. 38th St., N. Y. City (Importer).

SARIS, J. H., Beloit, Wis.

SHERWOOD Mfg. Co., Buffalo, N. Y.

SINTZ, Guy L., Fulton and Front Sts., Grand Rapids, Mich.

SPEED Changing Pulley Co., 750 E. Washington St., Indianapolis, Ind. (see page 49).

STANDARD Carbureter Co., Inc., Sabin and Mathewson Sts., Providence, R. I. (see page 215).

SWAIN Engine Co., 2339 State St., Chicago, Ill.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WESTERN Motor Co., Logansport, Ind.

WHEELER & Schebler, Indianapolis, Ind.

WILLET Engine & Carbureter Co., 764 Ellicott Sq., Buffalo, N. Y.

WILLIAMS Valve Co., D. T., 904-910 Broadway, Cincinnati, O.

WINKLEY Co. (The), 226 Abbott St., Detroit, Mich.

XARDELL Co., C. A., Utica, N. Y.

CARBURETER FLOATS (See Floats, Ball)

CARRIAGE HARDWARE (See Trimmings, Metal)

CASES (Engine, Gear and Chain)

ANDERSON & Co., F. W., 729 So. Broad St., Pholadelphia, Pa. (see pae 171).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (see page 193).

AUTO Top Co., Fort Wayne, Ind. (see page 171).

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

DETROIT Auto. Top Co., Detroit, Mich.

TURNER Brass Works (The), 72 Michigan St., Chicggo, Ill. (see page 79).

WILEY & Son Co., Wm. H., Box 30, Hartford, Conn. (see page 165).

CASTINGS (Brass, Bronze, Aluminum and Copper)

ALLEN Mfg. Co., W. D., 151 Lake St., Chicago, Ill.

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page opposite).

ALUMINUM Foundry Co., Manitowoc, Wis.

AMERICAN Brass Fdry. Co., Hyde Park, Mass.

AMERICAN Fdry. & Mach. Co., Hanover, Pa.

AMERICAN Pin Co., Waterbury, Conn.

BLAKE, Edwin J., 565 Windsor St., Hartford, Conn.

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BUCKEYE Iron & Brass Wks., 324 E. 3d St., Dayton, O.

CALDWELL Co. (The), 136 S. 4th St., Philadelphia, Pa.

CHICAGO Hardware Fdry. Co., North Chicago, Ill.

CLARK, John W., Albany, N. Y.

CLUM & Atkinson, 575 Lyell Ave., Rochester, N. Y.

COLUMBUS Brass Co., Columbus, O.

CRAMP & Sons Ship & Engine Building Co., Wm., Philadelphia, Pa.

DOMESTIC Sewing Machine Co., Warren and High Sts., Newark, N. J.

ELKHART Brass Mfg. Co., Prospect St., Elkhart, Ind.

ELM CITY Brass Co., New Haven, Conn.

ENTERPRISE Foundry Co., Detroit, Mich.

EUREKA Tempered Copper Wks., Northeast, Pa.

FOREST City Brass Wks., Cleveland, O.

GAYLORD Co., F. L., Ansonia, Conn.

GERSON-Carey Co., Lansing, Mich.

GRAHAM, James & Co., 293 Wooster St., New Haven, Conn.

HENDRYX & Co., Andrew B., New Haven, Conn.

HOFELLER Brass Fdry. Co., 100 Terrace, Buffalo, N. Y.

HOMER Brass Works, Inc., 231 Race St., Philadelphia, Pa.

HUMPHREYS Mfg. Co., Mansfield, O.

IMPERIAL Brass Mfg. Co. (The), 251 So. Jefferson St., Chicago, Ill.

JEFFERSON Brass Foundry, Brooklyn, N. Y.

KEYSTONE Brass Fdry. Co., 188 Berks St., Philadelphia, Pa.

KOKOMO Brass Wks., 351 N. Smith St., Kokomo, Ind.

LANGSENKAMP-Wheeler Co., Indianapolis, Ind.

LIGHT Mfg. & Fdry. Co., Union and Queen Sts., Pottstown, Pa. (see page 57).

MANHATTAN Brass Co., New York, N. Y.

MAYO Damper Co., 355 Walnut St., Pottstown, Pa.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 101).

MICHIGAN Brass Mfg. Co. (The), 74-78 Fort St. E., Detroit, Mich.

NEW JERSEY Aluminum Co., 19th and Springfield Ave., Newark, N. J.

NIAGARA Falls Brass Wks., Inc., Niagara and Virginia Sts., Buffalo, N. Y. (see page 55).

NOLTE Brass Co., Springfield, O.

NON-CORROSIVE Metal Co. (Inc.), Watertown, Conn.

NOONAN Tool & Machine Wks., Rome, N. Y.

NORWALK Brass Co., Norwalk, Conn.

OBERDORFER Brass Co., M. L., 804 East Water St., Syracuse, N. Y.

OHIO Brass Co., Mansfield, O.

PHOSPHOR Bronze Smelting Co., Philadelphia, Pa.

PIONEER Brass Works, Indianapolis, Ind.

PITTSBURG Brass Mfg. Co., 3153 Penn Ave., Pittsburg, Pa.

POWOW Foundry, Amesbury, Mass.

PROVIDENCE Brass Foundry & Machine Co., Providence, R. I.

RACINE Brass & Iron Co., Racine, Wis.

REEVES & Son, Paul S., 1415 Catherine St., Philadelphia, Pa.

RYAN & Co., J. J., 68-74 W. Monroe St., Chicago, Ill.

SHERWOOD Brass Works, 1167 Jefferson Ave., Detroit, Mich.

SPENCE Mfg. Co., 279 Park St., Milwaukee, Wis.

SPENCER'S Sons, I. S., Guilford, Conn.

STANDARD Foundry Co., Hartford, Conn.

STOVER Mfg. Co., Freeport, Ill.

SYRACUSE Aluminum & Bronze Co., 530 Leavenworth Ave., Syracuse, N. Y. (see page 57 and opposite).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

UNIQUE Metal Co., 16-18-20 Elk St., Buffalo, N. Y.

UNITED States Aluminum Co., Pittsburg, Pa.

U. S. Aluminum Castings Co., Hamilton & Vandalia Aves., Cincinnati, O.

U. S. Bronze Co., 149 Columbus St., Cleveland, O.

VINCENT Valve Co., Sandusky, O.

WALTHAM Brass & Aluminum Co., Waltham, Mass.

WESTERN Brass Mfg. Co., 21st and Rockwell Sts., Chicago, Ill.

WILLIAMS Valve Co., D. T., 904-910 Broadway, Cincinnati, O.

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

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Dimensions	.485" diameter.
Elastic Limit per sq. in.	51,400 lbs.
Maximum Strength per sq. in.	69,800 "
Reduction of Area	7.5 %
Elongation in 2"	6.5 %
Fracture	Crystalline

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THE HENRY SOUTHER ENGINEERING CO.

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BARCUS & Co., Geo., Wabash, Ind.

BARLOW, Arthur E., 28 Orange St., Newark, N. J.

BELLE CITY Mfg. Co., Racine Junction, Wis.

BRIDGEPORT Malleable Iron Co., Bridgeport, Conn.

BUFFALO Foundry Co., Buffalo, N. Y.

CAPITOL Foundry Co., Hartford, Conn.

CASCADE Foundry Co., 19th and Plum Sts., Erie, Pa.

CHICAGO Hardware Fdry. Co., North Chicago, Ill.

CRAMP & Sons Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

DETROIT Stoker & Foundry Co., No. Grand Blvd. and Riopelle St., Detroit, Mich.

ENTERPRISE Fdry. Co., Detroit, Mich.

ERIE Foundry Co., Erie, Pa.

FERRO Machine & Fdry. Co. (The), 115 Wade Building, Cleveland, O. (see page 191).

FULTON Fdry. & Mach. Wks., 25 Furman St., Brooklyn, N. Y.

GREY Iron Castings Co., Mt. Joy, Pa.

HAYES Foundry Co., Lynn, Mass.

HOLBROOK-Armstrong Iron Co., Racine, Wis.

HOPSON & Chapin Mfg. Co., New London, Conn.

INDIANAPOLIS Foundry Co., Indianapolis, Ind.

INTER-State Foundry Co., Cleveland, O.

MANUFACTURERS' Fdry. Co., Waterbury, Conn.

MARINETTE Gas Eng. Co., Chicago Heights, Ill.

MASSEY Machine Co., Watertown, N. Y.

MEEKER Fdry. Co., 95 Clay St., Newark N. J.

PALMERS & De Mooy Fdry. Co., Cleveland, Ohio.

PHILADELPHIA Stove & Iron Foundry Co., 1631 N. 5th St., Philadelphia, Pa.

RACINE Brass & Iron Co., Racine, Wis.

SESSIONS Foundry Co., Bristol, Conn.

SPENCER'S Sons, I. S., Guilford, Conn.

STANDARD Fdry. & Mfg. Co., Cleveland, O.

STOVER Mfg. Co., Freeport, Ill.

STOWELL Mfg. & Fdry. Co., So. Milwaukee, Wis.

TARRANT Foundry Co., Chicago, Ill.

UTICA Foundry Co., Utica, N. Y.

UTICA Steam Eng. & Boiler Wks., Utica, N. Y.

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WESTERN Motor Co., Logansport, Ind.

WILCOX, Crittenden & Co., Middletown, Conn.

CASTINGS (Malleable Iron)

ACME Steel & Malleable Iron Wks., 245 Military Road, Buffalo, N. Y.

ARCADE Malleable Iron Co., Worcester, Mass.

BARLOW, Arthur E., Newark, N. J.

BEAVER Dam Malleable Iron Co., Beaver Dam, Wis.

BRIDGEPORT Malleable Iron Co., Bridgeport, Conn.

BUHL Malleable Iron Co., Detroit, Mich.

COLUMBUS Malleable Iron Co., Columbus, O.

DAYTON Malleable Iron Co., Dayton, O.

EBERHARD Mfg. Co. (The), Cleveland, O.

FLAGG & Co., Stanley G., Philadelphia, Pa.

FRAZER & Jones Co., Syracuse, N. Y.

GLOBE Malleable Iron Co., Greenway Ave., Syracuse, N. Y.

ILLINOIS Malleable Iron Co., 535 Diversey Blvd., Chicago, Ill.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

MALLEABLE Iron Fittings Co., Branford, Conn.

MEEKER Fdry. Co., 95 Clay St., Newark, N. J.

MINNESOTA Malleable Iron Co., St. Paul, Minn.

MOLINE Malleable Iron Co., St. Charles, Ill.

NATIONAL Malleable Castings Co., Cleveland, O.

NAUGATUCK Malleable Iron Co., Naugatuck, Conn.

NORWAY Iron & Steel Co., York, Pa.

OSHKOSH Malleable Iron Co., Oshkosh, Wis.

PORT HURON Engine & Thresher Co., Port Huron, Mich.

RACINE Malleable & Wrought Iron Co., Racine, Wis.

RHODE ISLAND Malleable Iron Wks., Hills Grove, R. I.

SOUTH Side Steel & Malleable Casting Co., Windlake and 14th Aves., Milwaukee, Wis.

STOWELL Mfg. & Fdry. Co., So. Milwaukee, Wis.

SYRACUSE Malleable Iron Wks., Syracuse, N. Y.

WILMINGTON Malleable Iron Co., Wilmington, Del.

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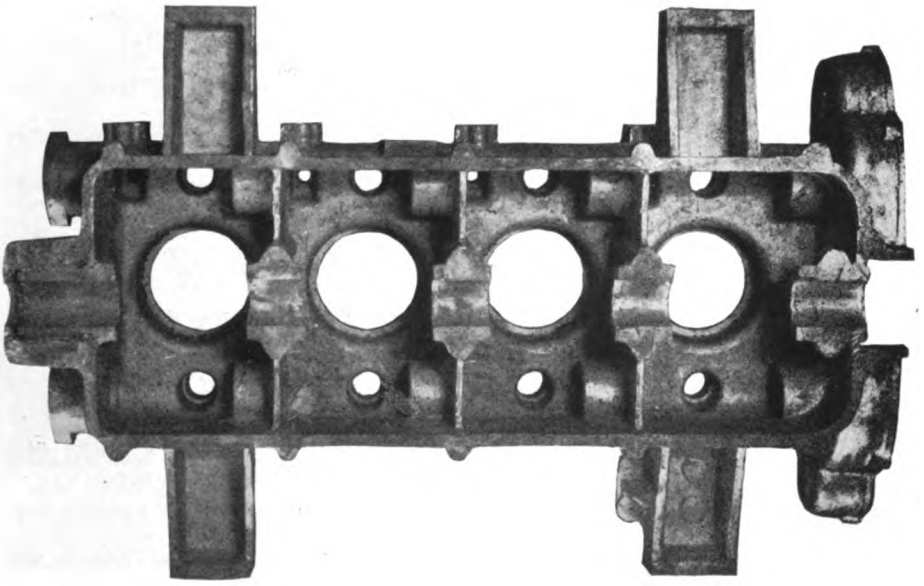

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CASTINGS (Steel)

ACME Steel & Malleable Iron Wks., 245 Military Road, Buffalo, N. Y.

ADRIAN Steel Casting Co., Adrian, Mich.

AMERICAN Steel Castings Co., Chester, Pa.

ARCADE Malleable Iron Co., Worcester, Mass.

ATHA Steel Co., Newark, N. J.

BETHLEHEM Steel Co., So. Bethlehem, Pa.

BUFFALO Crucible Casting Co., 25 Washington St., Buffalo, N. Y.

CARPENTER Steel Co. (The), Reading, Pa.

CHESTER Steel Castings Co., Chester, Pa.

CHROME Steel Works, Brooklyn, N. Y.

CRUCIBLE Steel Casting Co., Lansdowne, Pa.

CRUCIBLE Steel Castings Co., Milwaukee, Wis.

DUTCHER Co., J. A. & P. E., Milwaukee, Wis.

FERRO Carbon Castings Co., Frankfort, Philadelphia, Pa.

FLAGG & Co., Stanley G., Philadelphia, Pa.

FRAZER & Jones Co., Syracuse, N. Y.

JOHNSON & Co., Isaac G., Spuyten Duyvil, N. Y.

JOHNSTON, Geo. H., P. O. Box 13, Sparrows Point, Md.

LOGAN Mfg. Co., Phoenixville, Pa.

MACINTOSH, Hemphill & Co., Pittsburg, Pa.

MASSACHUSETTS Steel Casting Co., West Everett, Mass.

MESTA Machine Co., Pittsburg, Pa.

MILWAUKEE Steel Fdry Co., Milwaukee, Wis.

N. E. Steel Castings Co., Hyde Park, Mass.

NEWARK Iron & Steel Co., Newark, O.

NEW JERSEY Steel Co., Rahway, N. J.

NEW Process Steel Co. (The), Marshall, Mich.

NORTHMANN-Duffke Foundry Co., 26th and Layton Ave., Milwaukee, Wis.

NORWAY Iron & Steel Co., York, Pa.

OTIS Steel Co., Cleveland, O.

PROVIDENCE Steel Castings Co., 164 Allens Ave., Providence, R. I.

RIVERSIDE Foundry, The, 451-473 Riverside Ave., Newark, N. J.

SMITH Steel Castings Co., Geo. H., 500 Clinton St., Milwaukee, Wis.

TAYLOR Iron & Steel Co., High Bridge, N. Y.

TOBIN-Gerlinger Steel Castings Co., West Allis, Wis.

TOOL Steel Castings Co., 90 Canal St., Boston, Mass.

UNIFORM Steel Co., Newark, N. J.

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WHITELEY Steel Co., Muncie, Ind.

WILMINGTON Malleable Iron Co., Wilmington, Del.

WORCESTER Steel Foundry Co., Worcester, Mass.

CEMENT (Tire)

AMERICAN Cement & Oil Co., 44 W. Quincy St., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BROOKLYN Rubber Co., 397 Summer Ave., Brooklyn, N. Y.

BUFFALO Rubber Mfg. Co., Sussex Ave. and Erie R. R., Buffalo, N. Y.

BUFFALO Specialty Co., Buffalo, N. Y.

DIAMOND Rubber Co., Akron, O. (see page 209).

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

G. A. HOSMER Co., 376 Ellicott St., Buffalo, N. Y.

LYON Rubber Co., Akron, O.

M. & M. Manufacturing Co. (The), Akron, O.

MAGNET Cement & Dressing Co., 878 No. 48th St., Philadelphia, Pa.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NATIONAL Cement & Rubber Mfg. Co., Toledo, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers (see page 131).

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POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

REPUBLIC Rubber Co. (The), Youngstown, O.

REA Bros. & Co., 202 Nicollet Ave., Minneapolis, Minn.

TINGLEY & Co., Chas. O., Rahway, N. J.

CHAINS

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (see page 177).

DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapolis, Ind. (see page 61).

DUCKWORTH Chain & Mfg. Co., Springfield, Mass.

LEFEVRE Arms Co., Syracuse, N. Y.

LINK Belt Co., Chicago, Ill.

LINK Belt Engineering Co., Nicetown, Pa.

MILLER, Chas. E., 97 Reade St., N. Y. City. (Importer.)

MORSE Chain Co., Trumansburg, N. Y.

PEUGEOT Freres, 296 Broadway, N. Y. City (see page 7).

WHITNEY Mfg. Co. (The), Hartford, Conn.

CHANNELS

AMERICAN Steel & Wire Co., The Rookery, Chicago, Ill.

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

GARFORD Co. (The), Elyria, O.

HYDRAULIC Pressed Steel Co., Cleveland, O. (see back cover).

STANDARD Welding Co. (The), Cleveland, O.

WESTON-Mott Co., Flint, Mich.

CHARGING EQUIPMENT (Electrical)

ADVANCE Mfg. Co., Hamilton, O.

BAKER Motor Vehicle Co., Cleveland, O.

BENJAMIN Electric Mfg. Co., 42 W. Jackson Blvd., Chicago, Ill.

BRONSON & Davis, 463 Fairmount Ave., Blue Island, Ill.

BULLOCK Electric Mfg. Co., Cincinnati, O.

COOPER-Hewitt Electric Co., 220 W. 29th St., N. Y. City.

ELECTRIC-Vehicle & Garage Co., 621 Grand Ave., Milwaukee, Wis.

ELWELL-Parker Electric Co., 1076 Hamilton St., Cleveland, O.

GENERAL Elec. Co., Schenectady, N. Y.

GENERAL Power Co. (The), 100 William St., N. Y. City.

MERRIAM-Abbott Co., 60 E. Prospect St., Cleveland, O.

NEW England Motor Co., Liberty Square, Lowell, Mass. (see page 35).

RICHARDSON Engineering Co., Hartford, Conn. (see page 145).

ROTH Bros. & Co., 27-29 S. Clinton St., Chicago, Ill.

WAGNER Electrical Mfg. Co., 2017 Locust St., St. Louis, Mo.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.

CHASSIS (Gasoline)

BENDIX Co. (The), 4212 State St., Chicago, Ill. (see page 81).

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 119).

GARFORD Company (The), Elyria, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 41).

SMITH Co., A. O., Milwaukee, Wis.

CLEVICES (See Screw Machine Products)

CLOCKS (Auto)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

CHELSEA Clock Co., 16 State St., Boston, Mass. (Auto and Motor Boat) (see page opposite).

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

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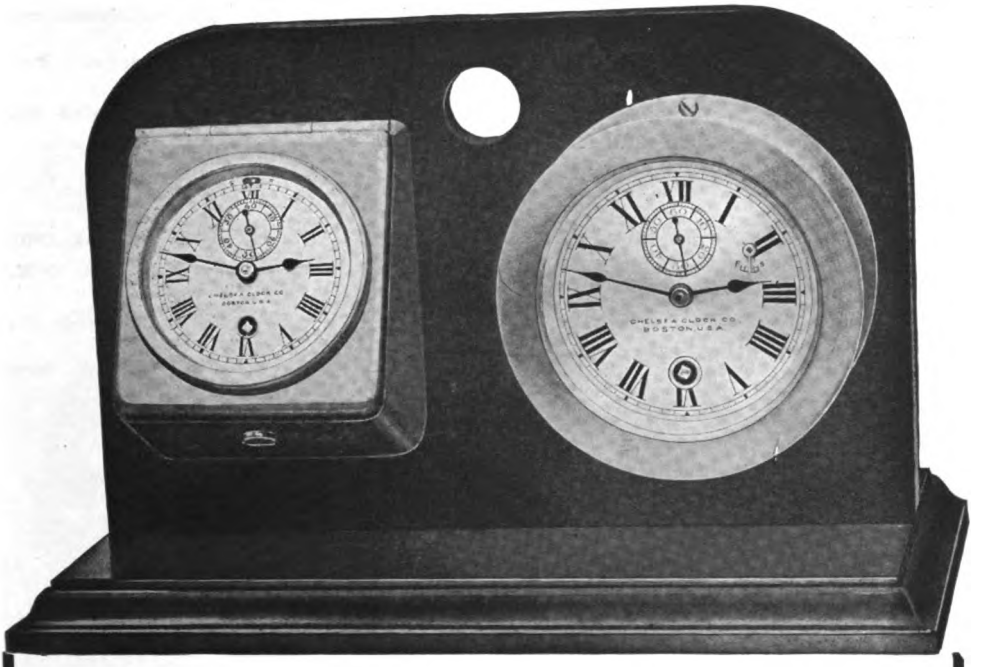

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3½ inch "Special" Auto Clock,	$45	3½ inch Auto Clock,	$28
3½ inch "Special" Motor Clock,	$41	3½ inch Motor Clock,	$24

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LEVY, Manasseh, 182 Broadway, New York.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see age 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers), (see page 17).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

WILSON Auto. Clock Co., 935 Arch St., Philadelphia, Pa.

WHEELOCK Motor Car Clock Co., Tremont Bldg., Boston, Mass.

CLOTHING (Auto)

AMERICAN Buffalo Robe Co., Buffalo, N. Y.

AUTO Garment Co., 208 B Ave., Cedar Rapids, Ia.

BISHOP & Co., The J. H., Wyandotte, Mich.

BRANN, E., 1225 Park Ave., N. Y. City.

BROOKS Bros., 22d St. and B'way, N. Y. City.

CROSBY Frisian Fur Co., 116 Mill St., Rochester, N. Y.

DAVIS Robe Co., The, Inc., 1307 Champlain Bldg., Chicago.

DEMMERLE & Co., 248 W. 23d St., N. Y. City.

DOUGHERTY & Colt Mfg. Co., 105 W. Bridge St., Columbus, O.

ENTERPRISE Rubber Co., 110 Federal St., Boston, Mass.

FULLER & Sullivan, 19 Elliott St., Boston, Mass.

GILBERT Mfg. Co., New Haven, Conn. (see page 163).

GUNTHER'S Sons, G. C., 184 5th Ave., N. Y. City.

HANSEN Mfg. Co., O. C., 356 E. Water St. Milwaukee, Wis.

HODGMAN Rubber Co., 806 Broadway, N. Y. City.

LILLEY, M. C., & Co., Columbus, O.

MACULLAR-Parker Co., Boston, Mass.

MESINGER Mfg. Co., H. & F., 1801-1803 First Ave., N. Y. City.

MILFORD Auto. Coat Co. (The), Milford, Mass.

MOORE-Smith Co., Boston, Mass.

MORAWETZ Co. (The), 343 Broadway, Milwaukee, Wis.

N. Y. Leather Coat Co., 207 Greene St., New York.

OUR Own Mfg. Co., 568-574 Broadway, New York.

PIONEER Woolen Mills, 1120 Beaufait St., Detroit, Mich.

ROGERS, Peet & Co., N. Y. City.

RUSZITS, John, Fur Co., 73-77 Mercer St., N. Y. City.

SAKS & Co., 34th St. and B'way, N. Y. City.

SCANDINAVIAN Fur & Leather Co., 16 W. 33d St., New York, N. Y.

SCOTT Muffler Co. (The), 71 Gallia St., Portsmouth, O.

SEABOARD Rubber Co., 278 Pearl St., New York.

SHUMAN, A., & Co., Boston, Mass.

SMITH, Gray & Co., N. Y. City.

SMITH, Crary & Davidge, 174 Water St., Binghamton, N. Y.

SPEAR-Martin Fur Co., Burlington, Vt.

SPRAGUE, F. H. Co., Orange, Mass.

STALL & Dean Mfg. Co., Brockton, Mass.

TOPLITZ, George, 878 Broadway, New York.

WAY Muffler Co. (The), 23d and Arch Sts., Philadelphia, Pa.

WESTERN Robe Co., Detroit, Mich.

CLUTCHES (Speed Changing)—(See Gears)

CLUTCHES

CARLYLE & Johnson Machine Co., Hartford, Conn.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich. (see page 111).

DOUBLE-Friction Coil Clutch Co., 45 Canal St., Chicago, Ill.

GARFORD Co. (The), Elyria, O.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 151).

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LONG Arm System Co., Cleveland, O.

MUNCIE Auto Parts Co., Muncie, Ind.

NATIONAL Brake & Clutch Co., Devonshire Bldg., Boston Mass (Cork Insert) (see page 65).

NORTH Chicago Machine Co., North Chicago, Ill.

NORTHWAY Motor & Mfg. Co., Maybury Grand Ave., Detroit, Mich.

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We have more sizes to select from than any other chain manufacturer and are best prepared to furnish the right chain for any ordinary or special service. Replace your old chain with a "Diamond" and it will soon prove its quality to be what the name indicates. Diamond Chains fit all American Cars.

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POWELL & Young, 52 W. 43d St., New York.

SMITH Co., A. O., Milwaukee, Wis.

SPEED Changing Pulley Co., 750 E. Washington St., Indianapolis, Ind. (see page 49).

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

UNIVERSAL Clutch Co., 226 S. 11th St., Philadelphia, Pa.

COCKS (See Fittings, Pipe, Brass)

COLUMNS (See Water Alarms and Columns)

COMMUTATORS (See Controllers, Electric)

COMPRESSORS (Air)

CHICAGO Pneumatic Tool Co., 1010 Fisher Bldg., Chicago, Ill.

CROWELL, Gilmer, 292-296 Graham St., Brooklyn, N. Y.

FERODOWILL Mfg. Co., St. Paul, Minn.

HUMPHREYS Mfg. Co., Mansfield, Ohio.

KALISH Air Brake Co., 1317 Chestnut St., St. Louis, Mo.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

MARTIN & Anson Co., 2226 Indiana Ave., Chicago, Ill.

NEW Era Gas Engine Co., 9 Dale Ave., Dayton, O.

PACIFIC Tucking & Mfg. Co., 471 18th St., Brooklyn, N. Y.

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page opposite).

VICTOR Electric Co., 51-55 Market St., Chicago, Ill.

WESTINGHOUSE Air Brake Co., Pittsburg, Pa.

COMPRESSORS (Register)

AUTO Novelty Co., Milwaukee, Wis. (see page 193).

CONDENSERS

NATIONAL Oil Burner & Equipment Co., Holland Bldg., St. Louis, Mo.

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

WHITLOCK Coil Pipe Co. (The), Hartford, Conn. (see page 89).

CONNECTING RODS

AMERICAN & British Mfg. Co., Bridgeport, Conn.

ANDERSON Forge & Machine Co., Detroit, Mich.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

ERIE Forge Co., Erie, Pa.

FUNK Engineering Co., 39 14th St., Hoboken, N. J.

GILL & Sons Forge & Machine Works, P. H., Brooklyn, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page opposite).

STANDARD Connecting Rod Co., Beaver Falls, Pa.

CONNECTORS, Wire (See Wire Terminals)

CONTROLLERS (Electric)

ELECTRIC Vehicle Equipment Co., 20th St. and Montgomery Ave., Philadelphia, Pa.

ELWELL-Parker Electric Co., 1076 Hamilton St., Cleveland, O.

GENERAL Electric Co., Schenectady, N. Y.

KNOBLOCK - Heideman Mfg. Co., South Bend, Ind.

LAMB & Co., Kent and Lyon Sts., Grand Rapids, Mich.

LINCOLN Electric Co., Cleveland, O.

WESTINGHOUSE Elec. & Mfg. Co., Pittsburg, Pa.

COOLERS (See Radiators)

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AUTOMOBILE SUPPLY CO.
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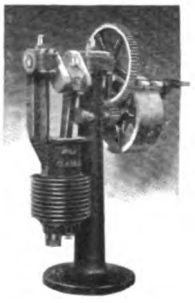

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CORK INSERTS (Brake and Clutch)

CONTINENTAL Motor Mfg. Co. (The), Muskegon, Mich. (see page 111).

NATIONAL Brake & Clutch Co., Devonshire Bldg., Boston, Mass. (see page opposite).

NORTHWAY Motor & Mfg. Co. (The), Detroit, Mich.

STANDARD Brake Co. (The), 101 W. 66th St., N. Y. City.

COUPLINGS (Brass) (See Also Fittings—Pipe)

FRIES & Co., 89-93 Main St., Buffalo, N. Y.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

LUNKENHEIMER Co. (The), Cincinnati, O.

PEDERSEN Mfg. Co., 400-412 East 37th St., N. Y. City (see page 103).

WILLIAMS Valve Co., D. T., 904-910 Broadway, Cincinnati, O.

YOUSE, E. S., Reading, Pa.

COUPLINGS (Hose)

DOYLE Hose Union Co. (The), 810 Ann St., Homestead, Pa.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

MORGAN, B., Newport, R. I.

N. J. Car Spring & Rubber Co., Wayne and Brunswick Sts., Jersey City, N. J.

PITTSBURG Hose Connector Co., Pittsburg, Pa.

COVERS (Auto)

ANDERSON & Co., F. W., 729 So. Broad St., Philadelphia, Pa. (see page 171).

BURGIN Bros., Springfield, Mass.

DUANE & Co., W. & J., 1771 Broadway, N. Y. City.

GILBERT Mfg. Co., New Haven, Conn. (see page 163).

HUME Carriage Co., Amesbury, Mass. (see page 39).

LANDERS Bros. Co., 445 10th St., Toledo, O.

MANHATTAN Auto Top Co., 249 W. 64th St., N. Y. City.

MUTTY Co., L. J., 28 Summer St., Boston, Mass. (see page 173).

TEEL Mfg. Co., Medford, Mass.

VEHICLE Apron & Hood Co., Columbus, O.

WILEY & Son Co., Wm. H., Box 30, Hartford, Conn. (see page 165).

CRANK SHAFTS

AMERICAN & British Mfg. Co., Bridgeport, Conn.

ANDERSON Forge & Machine Co., Detroit, Mich.

BILLINGS & Spencer Co., Hartford, Conn.

BLISS Co., E. W., Adams & Plymouth Sts., Brooklyn, N. Y.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 69).

ERIE Forge Co., Erie, Pa.

FUNK Engineering Co., 39 14th St., Hoboken, N. J.

GILL & Sons, P. H., Forge & Mach. Wks., Brooklyn, N. Y.

LELAND, W. H., & Co., Southbridge St. and Hope Ave., Worcester, Mass.

NEW England Forge Co., 9 Plymouth St., Worcester, Mass.

RICHMOND Forgings Corp., Richmond, Va.

STANDARD Connecting Rod Co., Beaver Falls, Pa.

STANDARD Welding Co. (The), Cleveland, O.

TINDEL-MORRIS Co., Eddystone, Pa.

WYMAN & Gordon, 30 Bradley St., Worcester, Mass.

CRUCIBLES

BRIDGEPORT Crucible Co., Bridgeport, Conn.

DIXON, Jos., Crucible Co., Jersey City, N. J.

OBERMAYER Co., S. (The), 641 Evans St., Cincinnati, O.

WISCONSIN Graphite Co., Allegheny, Pa.

CUPS (Ball)

CROSBY Co. (The), Buffalo, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

NATIONAL Cycle Mfg. Co., Bay City, Mich.

WORCESTER Pressed Steel Co., Worcester, Mass.

CUPS AND CONES

CORBIN Screw Corporation (The), New Britain, Conn.

DETROIT Screw Works, Detroit, Mich.

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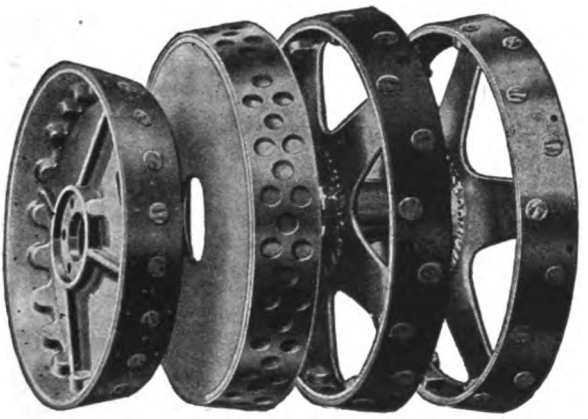
Cork Insert Clutches

Give Better Control



Give Increased Power

Cork Inserts

(Patented)

give easy engagement, permit the use of less spring pressure, prevent burning of leather facings, eliminate the cutting of metal-to-metal surfaces and are otherwise of material benefit. That the 27 manufacturers given below have adopted them after tests covering thousands of miles is positive proof of the increased efficiency they give.

Three-Plate Disc Clutches
The Autocar Co.
The E. R. Thomas Motor Co.
The Nordyke & Marmon Co.
The Continental Motor Mfg. Co.
The American Machine Mfg. Co.
The Dolson Automobile Co.
The Queen Motor Car.
The Frontenac Motor Co.
The Deere-Clark Motor Car Co.
Expanding Ring Clutches
The Coppock Motor Car Co.
Multiple Disc Clutches
The Stevens-Duryea Co.
The Northway Motor & Mfg. Co.
The Jackson Motor Car Co.
The Bay State Automobile Co.
Metal-to-Metal Cone Clutches
The Knox Automobile Co.
The Mack Bros. Motor Car Co.
The York Motor Car Co.
The B L. M. Motor Car Co.
The Standard Brake Co.
Leather-Faced Cone Clutches
The George N. Pierce Co.
The Garford Co.
The Rainier Co.
The Cleveland Motor Car Co.
The Studebaker Automobile Co.
The Tiley-Pratt Co.
The "Long-Arm" System Co.
Friction or Ignition Devices
The Dayton Electrical Mfg. Co.

Selling Agency Notice.—The Standard Brake Co., of 101 West Sixty-sixth Street, New York, is authorized to manufacture Cork Insert Clutches for the Trade and to arrange with manufacturers for Licenses on precisely the same terms granted to others by the National Brake & Clutch Co., and manufacturers may negotiate for Linceses through the Standard Brake Co., or direct with the National Brake & Clutch Co., as is deemed most expedient.

For particulars apply to the

NATIONAL BRAKE & CLUTCH CO.

Devonshire Building, BOSTON, MASS.

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GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

HARTFORD Machine Screw Co., 476 Capitol Ave., Hartford, Conn.

HOUGHTON & Buxton, Worcester, Mass.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

MATHEWS, H. A., Mfg. Co., Seymour, Conn.

PENINSULAR Milled Screw Co., Detroit, Mich.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WESTERN Automatic Machine Screw Co. (The), Elyria, O.

CURTAINS (Storm)

ANDERSON & Co., F. W., 729 So. Broad St., Philadelphia, Pa. (see page 171).

CURTAIN Supply Co., 85-93 Ohio St., Chicago, Ill.

ENEAS, A. G., 50 Congress St., Boston, Mass.

SPRAGUE Umbrella Co. (The), Norwalk, O. (see page opposite).

CURTAIN FASTENERS

BOWERS Metal Stamping Co., 718 E. 11th St., New York, N. Y.

MURPHY Co., The G. W. J., Merrimac, Mass.

NEIDER Co., F. A. (The), Augusta, Ky. (see page 173).

PARRY & Co., A. N., Amesbury, Mass.

ROEHM & Davison, Woodbridge and Wayne Sts., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 175).

TAYLOR Co., H. D., 103-105 Oak St., Buffalo, N. Y.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

U. S. Fastener Co., 95 Milk St., Boston, Mass.

WEISS & Son, Chas., 4725 Cottage Grove Ave., Chicago, Ill.

WING Co., Charles, Amesbury, Mass.

CUSHIONS

ANDERSON & Co., F. W., 729 So. Broad St., Philadelphia, Pa. (see page 171).

AUTO Top Co., Fort Wayne, Ind. (see page 171).

DETROIT Carriage Co., Detroit, Mich.

EMPIRE Gear & Top Co., 53 Mechanic St., Newark, N. J.

HALLIDAY, C. A., 42 Cedar St., Oneida, N. Y.

HILL Mfg. Co., 25 Fuller St., Buffalo, N. Y.

KELLEY, E., & Co., 509 Main St., Worcester, Mass.

LARRIMORE Buggy Top Co., Baltimore, Md.

MECHANICAL Fabric Co., Providence, R. I.

NEWTON, W. H. & Son, 127 Elm St., Cortland, N. Y.

PELINKA, Frank, 409 Blue Island Ave., Chicago, Ill.

PNEUMATIC Mattress & Cushion Co., 5 Fourth St., N. Y. City.

SPRINGFIELD Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass. (see page 171).

WARNER Pole & Top Co., 1655 Central Ave., Cincinnati, O.

CYCLOMETERS (See Indicators —Speed and Distance)

DASHES AND FENDERS

A-Z Co. (The), 527 West 56th St., N. Y. City.

AMERICAN Auto Brass Co. (The), 181 W. Maple St., Columbus, O.

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J. (see page 15).

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 45).

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 133).

COLE & Woop, New York City.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 43).

DANN Bros. Co., New Haven, Conn.

DETROIT Auto Specialty Co., 909-911 Greenwood Ave., Detroit, Mich. (see page 89).

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

EVERITT, B. F., Detroit, Mich.

FEDDERS Mfg. Co., Buffalo, N. Y. (see page 133).

GRAY & Sons, Peter, 90 Union St., Boston, Mass.

HALL, E. H. Co. (The), Inc., 12 Elm St., Rochester, N. Y.

HAYES Mfg. Co. (The), 360-370 Maybury Ave., Detroit, Mich. (see page 43).

INDIANAPOLIS Dash Co., Indianapolis, Ind.

KELLS, W. J., Mfg. Co., Jersey City, N. J.

KINSEY Mfg. Co. (The), Dayton, O.

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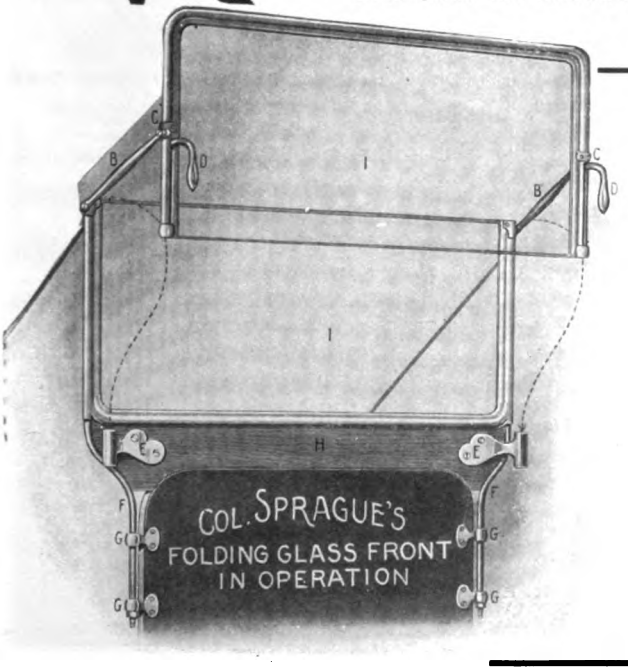

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¶ Col. Sprague presents his New Patent Folding Front for 1907. The sash are made either of solid, pressed brass or pressed steel, enameled to imitate oak, mahogany or rosewood. They work completely, and one does not have to leave the seat to change it from one position to another. Open or closed, it is all right. Ask for our catalogue and price list.

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Norwalk, Ohio, U.S.A.

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LOCKE & Co., 218-220 West 84th St., New York.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

MAYO Radiator Co. (The), New Haven, Conn. (see page 89).

M'KINNON Dash Co., Buffalo, N. Y.

MOORE & Munger Co., 602 W. 52d St., New York.

MULLINS Co., The W. H., Salem, O.

NEW York Dash & Fender Co., 516-520 W. 36th St., N. Y. City.

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

PETERS & Herron Dash Co. (The), Columbus, O.

PURSELL Mfg. Co., P. M., 802 Beecher St., Indianapolis, Ind. (see page 89).

QUINBY & Co., J. M., Newark, N. J.

SPRINGFIELD Metal Body Co., 387 Birnie Ave., Brightwood, Mass. (see page 169).

WRIGHT Cooler & Hood Mfg. Co., 335 Wabash Ave., Chicago, Ill.

DROP FORGINGS

AMERICAN & British Mfg. Co., Bridgeport, Conn.

ANDERSON Forge & Machine Co., Detroit, Mich.

ATLAS Drop Forge Co., Lansing, Mich.

ATWATER Mfg. Co. (The), Southington, Conn.

BAKER, Jas. H., Mfg. Co., 503 Park Bldg., Pittsburg, Pa.

BATES Forge Co., 227 W. Merrill St., Indianapolis, Ind.

BELDEN Machine Co., New Haven, Conn.

BETHLEHEM Steel Co., So. Bethlehem, Pa.

BILLINGS & Spencer Co., Hartford, Conn.

BLAKESLEE Forging Co., Plantville, Conn.

BLISS Co., E. W., Adams & Plymouth Sts., Brooklyn, N. Y.

BROOKEBANK, Mullin & Co., 409 Commerce St., Philadelphia, Pa.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page opposite).

CAPE Ann Tool Co., Pigeon Cove, Mass.

CHICAGO Drop Forge & Foundry Co., West Pullman, Ill.

CLAPP, E. D., Mfg. Co. (The), Auburn, N. Y.

CONSOLIDATED Mfg. Co., Toledo, O.

CORLISS Engine Works, Providence, R. I.

CORTLAND Forging Co., Cortland, N. Y. (see page 43).

CRESCENT Forgings Co., Oakmont, Pa.

DETROIT Forging Co., Detroit, Mich.

DYSON, Jos. & Sons, Hamilton and Kirtland Sts., Cleveland, O.

EASTERN Forge Co., 70 Kilby St., Boston, Mass.

ECCLES, Richard, Auburn, N. Y.

FARIST Steel Co. (The), 137 E. Main St., Bridgeport, Conn.

FUNK Engineering Co., 39 14th St., Hoboken, N. J.

GENERAL Drop Forge Co., 1738 Elmwood Ave., Buffalo, N. Y. (see page opposite).

GERHAB, Jacob, 158-164 No. 3d St., Philadelphia, Pa.

GRANGER'S Drop Forge Works, Chicago, Ill.

INDIANAPOLIS Drop Forging Co., Madison Ave. and Downey St., Indianapolis, Ind.

KEYSTONE Drop Forge Co., Chester, Pa.

KILBORN & Bishop Co. (The), New Haven, Conn.

KINGSTON Truck & Bolt Co., Kingston, N. Y.

MACHINERY Forging Co., Cleveland, O.

MICHIGAN Bolt & Nut Wks., Detroit, Mich.

MOORE Drop Forging Co., Springfield, Mass.

PAIGE-Storms Drop Forge Co., Chicopee Falls, Mass.

REVERE Drop Forge Co., Revere, Mass.

RICHMOND Forging Corporation, Richmond, Va.

RYMAN Co., K. L., 164 Market St., Newark, N. J.

SCRANTON Forging Co., Scranton, Pa.

SEWARD & Son Co., M., New Haven, Conn.

SMITH Co., A. O., Milwaukee, Wis.

SMITH, H. D., & Co., Plantsville, Conn.

SPRINGFIELD Drop Forging Co., Springfield, Mass.

STRIEBY & Foote Co., 301 Ogden St., Newark, N. J.

TRASNUE & Williams Co. (The), Alliance, Ohio.

UNION Drop Forge Co., 64-76 E. Ohio St., Chicago, Ill.

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WHITMAN & Barnes Mfg. Co., Akron, O.

WILCOX, D., Mfg. Co., Mechanicsburg, Pa.

WILLIAMS, J. H., & Co., Brooklyn, N. Y.

WORCESTER Pressed Steel Co., Worcester, Mass. (cold).

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DYNAMOS (See Generators)

EJECTORS

LOCKE Regulator Co., Salem, Mass.

PENBERTHY Injector Co., Detroit, Mich.

RUE Mfg. Co., 215 Race St., Philadelphia, Pa.

SHERWOOD Mfg. Co., Buffalo, N. Y.

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KALBFLEISCH, Franklin H. Co., Broadway and 16th St., N. Y. City.

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EATON & Prince, 76 Mich. St., Chicago, Ill.

HOYT Elevator Co., 129 Pearl St., Boston, Mass.

NEW Amer. Elevator Co. (The), Curtis and Jefferson Ave., Columbus, O.

OTIS Elevator Co., Railway Exchange, Chicago, Ill.

EMERGENCY CASES (Medical)

ABBEY & Co., P. L., Kalamazoo, Mich. (see page opposite).

U. S. Emergency Case Co., Utica, N. Y.

ENAMEL

ACME White Lead & Color Wks., Detroit, Mich.

ADAMS & Elting Co., 155 W. Washington St., Chicago, Ill.

AMERICAN Enamel Co., Providence, R. I.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (see page opposite).

BERRY Bros., Ltd., Detroit, Mich.

BUFFALO Enamel & Stain Co., 70-72 W. Genesee St., Buffalo, N. Y.

COLOPHITE Co. (The), New Haven, Conn.

DETROIT White Lead Wks., 532 E. Milwaukee Ave., Detroit, Mich.

Maswry & Son, John W., 50 Jay St., Brooklyn, N. Y.

DITZLER Color Co., 14 Baltimore Ave. W., Detroit, Mich.

FELTON, Sibley & Co., 136-140 North Fourth St., Philadelphia, Pa.

MASURY & Son, John W., 50 Jay St., Brooklyn, N. Y.

NATIONAL Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, O.

RUBBER Paint Co., 154-156 W. Van Buren St., Chicago, Ill.

SHERWIN-Williams Co., 100 Canal St., Cleveland, O.

STANDARD Varnish Works, 29 B'way, N. Y. City (see page 179).

VALENTINE & Co., 257 Broadway, N. Y. City.

WATTS-De Golyer Co. (The), 377-391 Illinois St., Chicago, Ill.

ENGINES (Gasoline) (See Motors, Gasoline)

ENGINES (Steam)

ABELL, Rollin, 370 Atlantic Ave., Boston, Mass.

DIETER Steam Engine Co., 106 Liberty St., New York.

ESTY, Wm., 59 Mill St., Laconia, N. H.

HILBURN, Edwin, Spring Valley, Minn.

LAKEPORT Mfg. Co., Lakeport, N. H.

MASON Regulator Co., 158 Summer St., Boston, Mass.

MILNE, Frank, Crescent St., Everett, Mass.

NADIG, C. H., & Bro., Mfg. Co., 16-24 No. 4th St., Allentown, Pa.

RACINE Engine & Iron Wks., Racine, Wis.

RANDALL, G. N., 1094 French St., Meadville, Pa.

ROCHESTER Machine Tool Wks., Ltd., Rochester, N. Y.

SANTA Ana Machine & Foundry Co., Santa Ana, Cal.

SMITH, Wm. J., New Haven, Conn.

WILLIAMS Co. (The), John, 114-118 Liberty St., N. Y. City.

EYE SHIELDS

AMERICAN Thermo-ware Co., 16 Warren St. (Importers), New York.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page opposite).

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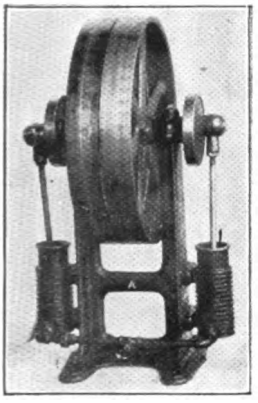
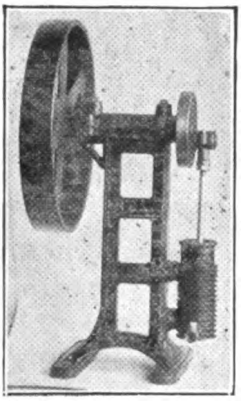
OUR STAR PUMPS are built to stand all kinds of hard usage, as all bearings can be tightened and taken up at any time: crank pins are all hardened and will wear a lifetime. Our low price on these pumps is no criterion of the quality.



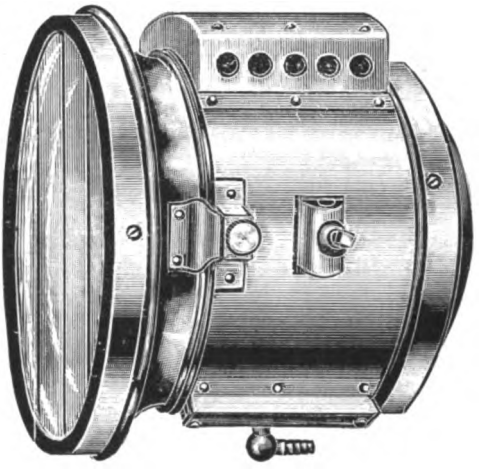
STAR A PUMP
With Tight and Loose Pulleys

This pump has two cylinders 2 7-16 with a 5-inch stroke and has a capacity of pumping up to 200 pounds pressure in tank of 120 gallons per hour at 125 R. P. M. It is made like our Style B Pump. Only has two cylinders. This pump is to be desired where a big volume of air is needed.



STAR B, With Tight Pulley or Tight and Loose Pulley

This pump is made like a gas engine, using two steel rings on piston cylinder and piston ground to fit; has a pumping capacity of 125 pounds at 125 R. P. M. in 80-gallon tank in 40 minutes. This pump will last a lifetime as it has nothing to wear or get out of order. Cylinder is 2 7-16 and stroke 5 inches.



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En tour, In the Home, and at the Summer Cottage.

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Insures your having in a neat case en tour, or fastened to the wall in a convenient place every article that up-to-date surgery would require to properly dress a wound.

It helps you, it helps the patient, it helps the physician.

The articles in the case would cost you much more at retail than we charge for the complete cabinet.

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Prices, $1.50, $4.00 & $7.00 ea.

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AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) see page 107).

CHICAGO Eye Shield Co., 112 Randolph St., Chicago, Ill.

EHRLICH & Son, J., 1345 Broadway, N. Y. City.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

GLOBE Optical Co., Boston, Mass.

LLOYD, A. J., & Co., 323 Washington St., Boston, Mass.

MEYROWITZ, E. B., 104 E. 23d St., N. Y. City.

MILLER, Chas. E. (Importer), 97 Reade St., N. Y. City.

MILLS Mfg. Co., 1368-1370 Broadway, N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUNSELL & Co., Eugene, 218 Water St., N. Y. City.

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

NORTH Carolina Mica Co., 95 Blackstone St., Boston, Mass.

OELSCHLAGER Bros., 42 E. 23d St., N. Y. City.

OPTHALMUSCOPE Co., Toledo, O.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co., (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

SCHEIDIG & Co., John, 50 Maiden Lane, N. Y. City.

SPENCER Optical Mfg. Co., 15 Maiden Lane, N. Y. City.

SUSSFIELD, Lorsch & Co., 37 Maiden Lane, N. Y. City.

TEXAS Co. (The), Chicago, Ill.

FELT WASHERS

BOOTH, N. E., 743-45 39th St., Brooklyn, N. Y. (see page 127).

FIRE EXTINGUISHERS

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BADGER Fire Extinguisher Co. (The), 32 Portland St., Boston, Mass.

CHILDS Co., O. J., Utica, N. Y.

HARRIS Safety Co., N. Y. City.

HAVERHILL Fire Appliance Co., Haverhill, Mass.

HOWE, G. S. & A. J., Co., 117 Exchange St., Worcester, Mass.

LANDAU, Henry W., 117 Green St., Newark, N. J. (see page opposite).

LIBERTY Association, 12-14 State St., Chicago, Ill.

LITTLE Giant Mfg. Co., 88 Wall St., N. Y. City.

MONARCH Fire Appliance Co., 249 Pearl St., New York City.

NEVERMISS Fire Extinguisher Co., Middletown, N. Y.

PHOENIX Appliance Co., 15 W. 28th St., N. Y. City.

REX Fire Extinguisher Co., 74 Cortlandt St., N. Y. City.

ROCKFORD-Kalamazoo Fire Extinguisher Co., 424 Ashton Bldg., Rockford, Ill.

STEMPEL Fire Apparatus Mfg. Co., 4520 N. 20th St., St. Louis, Mo.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

FITTINGS (Pipe, Brass)

BARRETT Mfg. Co., James, Boston, Mass.

BELFIELD & Co., H., Philadelphia, Pa.

BELKNAP Mfg. Co., Bridgeport, Conn

BEST Manufacturing Co., Pittsburg, Pa.

BUCKEYE Iron & Brass Works, Dayton, O.

CENTRAL Brass Works, Cincinnati, Ohio.

CHAMBERS & Ainslee, Newark, N. J.

CRANE Co., Chicago, Ill.

DALTON-Ingersoll Co., Boston, Mass.

DARLING Pump & Mfg. Co., Williamsport, Pa.

DETROIT Lubricator Co., Detroit, Mich.

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EASTWOOD Wire Mfg. Co., Belleville, N. J.

EATON, Cole & Burnham Co., New York, N. Y.

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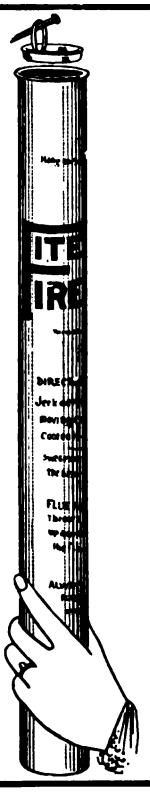
Over 500 Garages Equipped.

DISCOUNT ON QUANTITIES.

22 in. long; 2 in. diameter; weight 3 pounds; equal to 120 gallons of water; generates Nitrogen gas, which is an absolute non-supporter of combustion; guaranted to refill free of charge at any time when used in actual fire emergency. Send for circular and letters of people that have had fires and used "Fite Fire," the only extinguisher that can do what a liquid can't do.



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INDEX
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STABILITY
QUALITY

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Attractive Proposition to Dealers

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MINNEAPOLIS, MINN.

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FRIES & Co., 89-93 Main St., Buffalo, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

HAMLIN & Emery Brass Co., Boston, Mass.

HAYDENVILLE Co., Haydenville, Mass.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

HOFFMAN & Billings Manufacturing Co., Milwaukee, Wis.

HUMPHREYS Mfg. Co., Mansfield, O.

IDEAL Manufacturing Co., Detroit, Mich.

ILLINOIS Malleable Iron Co., Chicago, Ill.

IMPERIAL Brass Mfg. Co., 251 So. Jefferson St., Chicago, Ill.

JARECKI Manufacturing Co., Erie, Pa.

KINSEY & Mahler Co., Peoria, Ill.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LUNKENHEIMER Co. (The), Cincinnati, O.

McDONALD & Morrison Manufacturing Co., A. Y., Dubuque, Iowa.

McNAB & Harlin Mfg. Co., New York, N. Y.

McRAE & Roberts Co., 227-235 Campbell Ave., Detroit, Mich.

MANSFIELD Manufacturing Co., Pittsburg, Pa.

MASON Regulator Co., Boston, Mass.

MILWAUKEE Brass Mfg. Co., Milwaukee, Wis.

MULLANEY'S Sons, Jas., New York, N. Y.

NEW Britain Brass Co., New Britain, Conn.

PETRIE, John, New Haven, Conn.

PIONEER Brass Works, Indianapolis, Ind.

PITTSBURG Valve & Fittings Co., Pittsburg, Pa.

PLEUGER & Henger Mfg. Co., 11th and Herbert Sts., St. Louis, Mo.

POWELL Co., Wm., Cincinnati, Ohio.

POWHATTAN Brass & Iron Wks., Charlestown, W. Va.

PREST-O-Lite Co. (The), 1904 Broadway, N. Y. City (see page 165).

QUEEN City Brass & Iron Works, Cincinnati, O.

REGESTER'S Sons Co., J., Baltimore, Md.

ROSE, Clarence H., 1905 Park Row Bldg., N. Y. City.

RUNDLE-Spence Mfg. Co., Milwaukee, Wis.

SPEAKMAN Supply & Pipe Co., Wilmington, Del.

SPENCE Mfg. Co., 279 Park St., Milwaukee, Wis.

STANDARD Metalwork Co., Thompsonville, Conn.

STANDARD Sanitary Mfg. Co., Pittsburg, Pa.

STEBBINS Mfg. Co., E., Springfield, Mass.

THOMAS Brass and Iron Co., Waukegan, Ill.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WALWORTH Manufacturing Co., Boston, Mass.

WESTERN Tube Co., Kewanee, Ill.

WILLIAMS Valve Co., D. T., 904-910 Broadway, Cincinnati, O.

FLOATS (Ball)

DIAMOND Stamped Ware Co., Detroit, Mich.

HERCULES Float Co., Springfield, Mass.

NAUGATUCK Mfg. Co., Naugatuck, Conn.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

FOOT RESTS

BURROWS Co., E. T., Portland, Me.

HILLMAN Plating Co., 446 Tremont St., Boston, Mass.

HUME Carriage Co., Amesbury, Mass. (see page 39).

RANDS Mfg. Co., 51 Macomb St., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 175).

WARNER Pole & Top Co., 1655 Central Ave., Cincinnati, O.

FOOT WARMERS (See Heaters)

FORGE EQUIPMENT

AMERICAN Blower Co., Detroit, Mich.

AMER. Gas. Furnace Co., 23 John St., N. Y. City.

BILLINGS & Spencer, Hartford, Conn.

BOYNTON & Plummer, Worcester, Mass.

BUFFALO Forge Co., Buffalo, N. Y.

INGERSOLL-Sargeant Drill Co., N. Y. City.

MINER & Peck Mfg. Co., New Haven, Conn.

STURTEVANT Co., B. F., Boston, Mass.

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FRAMES (Pressed Steel)

AMERICAN & British Mfg. Co., Bridgeport, Conn.

BETHLEHEM Steel Co., So. Bethlehem, Pa.

HYDRAULIC Pressed Steel Co., Cleveland, O. (see back cover).

KINSEY Mfg. Co., Dayton, O.

PARISH Mfg. Co., Reading, Pa.

PARISH & Bingham Co., Cleveland, O. (see page opposite).

SMITH Co., A. O., Milwaukee, Wis.

FRICTION CLUTCHES (See Gears)

FUNNELS (Gasoline)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co. 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

A-Z Co. (The), 527 West 56th St., N. Y. City.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo.. (Dealers and Jobbers) (see page 107).

BREEZE Motor Mfg. Co., 33 Court St., Newark, N. J.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 69).

DOVER Stamping & Mfg. Co., 381 Putnam Ave., Cambridge, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St.. Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co. 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

FROST Mfg. Co., Kenosha, Wis.

GRAY & Sons, Peter, 90 Union St., Boston, Mass.

IVER Johnson Sporting Goods Co., Boston, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

TALIAFERRO, W. T., 258 Broadway, N. Y. City.

WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill. (see page 159).

GALVANIZING

BRIDGEPORT Electro Plating Co., Bridgeport, Conn.

BRISCOE Mfg. Co., Detroit, Mich. (see page 133).

GALVANIZING Co. (The), 525 N. Front St., Philadelphia, Pa.

U. S. Electro-Galvanizing Co., 1-9 Park Ave., Brooklyn, N. Y.

GASKETS

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

GOODWIN & Kintz Co., Winsted, Conn.

GUILLOTT Metal Gasket Co., 97 S. Clinton St., Chicago, Ill.

HERZ & Co. (Importers), 203-205 Lafayette St., N. Y. City.

JOHNS-Manville Co., H. W., 100 William St., New York.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

McCORD & Co., Old Colony Bldg., Chicago, Ill. (see page 101).

MORSE, R. F., 74 Weybosset St., Providence, R. I.

N. J. Asbestos Co., Camden, N. J.

N. J. Car Spring & Rubber Co., Wayne and Brunswick Sts., Jersey City, N. J.

REPUBLIC Belting & Supply Co., Cleveland, Ohio.

SMOOTH-ON Mfg. Co., 572 Communipaw Ave., Jersey City, N. J.

U. S. Indestructible Gasket Co., 8 So. William St., New York.

U. S. Mineral Wool Co., N. Y. City.

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AMERICAN Steel Barrel Co., 204-206 Varet St., Brooklyn, N. Y.

BOSTON Auto Gage Co., 613 Old South Bldg., Boston, Mass. (see page 99).

BLOOD Bros. Mach. Co., Kalamazoo, Mich.

CONNECTICUT Telephone & Electric Co., Inc., Meriden, Conn.

FREER Gauge Co., Everett Bldg., Akron, O.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

KINSEY Mfg. Co., Dayton, O.

MARTIN, M. A., 518 W. 63d St., Chicago, Ill.

OHIO Brass Co., Mansfield, O.

ROSS Engineering Co., 97 S. Clinton St., Chicago, Ill.

RUTENBER Co., Chicago, Ill.

SIMMONS, John, Co., 104-110 Centre St., N. Y. City.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page opposite).

WEBSTER Mfg. Co., 261 Jefferson Ave., Detroit, Mich. (see page 159).

GAUGES (Pressure)

AMERICAN Steam Gauge & Valve Mfg. Co., Jamaica Plains, Boston, Mass.

ASHCROFT Mfg. Co., 87 Liberty St., N. Y.

ASHTON Valve Co., 271 Franklin St., Boston, Mass.

AUTO Novelty Co., Milwaukee, Wis.

BOSTON Steam Specialty Co., 168-170 Congress St., Boston, Mass.

CROSBY Steam Gage & Valve Co., 97 Oliver St., Boston, Mass.

PITTSBURG Gauge & Supply Co., 309 Water St., Pittsburg, Pa.

SCHAEFER & Budenburg Mfg. Co., Foxboro, Mass.

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

WRAY Pump & Register Co., Rochester, N. Y.

GAUGES (Water Line)

AMERICAN Steam Gauge & Valve Mfg. Co., Jamaica Plain, Boston, Mass.

KNOWLSON & M'Conihe, 65 River St., Troy, N. Y.

McRAE & Roberts Co., 227-235 Campbell Ave., Detroit, Mich.

RELIABLE Water Gauge Co., 1616 Pine St., St. Louis, Mo.

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

GEAR BLANKS

DETROIT Screw Works, Detroit, Mich.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

NEW England Forge Co., 9 Plymouth St., Worcester, Mass.

GEAR CASES (Auto)

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page 51).

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 45).

BRIDGEPORT Deoxidized Bronze & Metal Co., Bridgeport, Conn.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

GARFORD Co. (The), Elyria, O.

LIGHT Mfg. & Fdry. Co., Union and Queen Sts., Pottstown, Pa. (see page 57).

NIAGARA Falls Brass Works, Inc., Niagara and Virginia Sts., Buffalo, N. Y. (see page 55).

PIONEER Brass Wks., Indianapolis, Ind.

SYRACUSE Aluminum & Bronze Co., 530 Leavenworth Ave., Syracuse, N. Y. (see pages 27 and 53).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page opposite).

U. S. BRONZE Co. (The), Cleveland, O.

GEARS (Differential)

BOSTON Gear Wks., Norfolk Downs, Mass.

BROWN-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y. (see page 91).

BULTMAN & Co., F. H., 131 Viaduct, Cleveland, O.

CULLMAN Wheel Co., 1030 Dunning St., Chicago, Ill. (see page 91).

GARFORD Co. (The), Elyria, O.

GRAY-Hawley Mfg. Co., 605-609 Fort St. W., Detroit, Mich.

MUNCIE Auto Parts Co., Muncie, Ind.

MUNCIE Gear Works, 801 E. Charles St., Muncie, Ind.

WARNER Gear Co., Muncie, Ind.

GEARS, REVERSE (Marine)

BRODIE, Wm. H., 45 Vesey St., N. Y. City.

CARLYLE & Johnson Mach. Co., Hartford, Conn.

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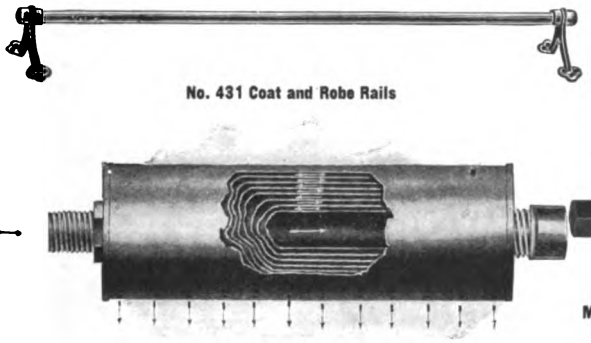

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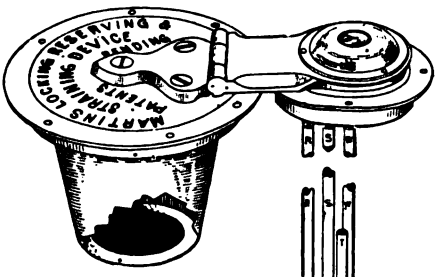
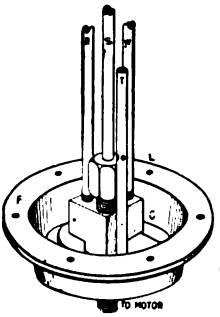
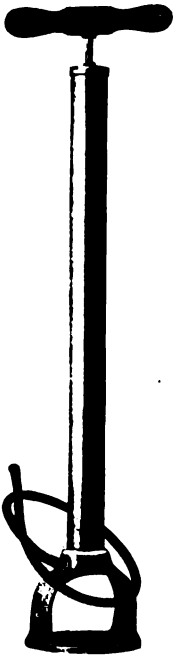
Martin Multiple Feed Lubricator

Martin Gasoline Strainer





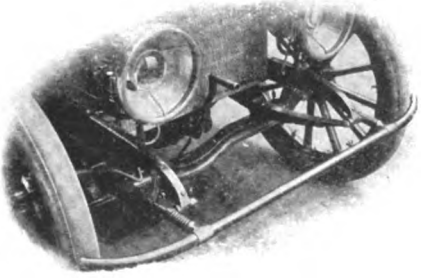
Martin Locking, Reserving, Supplying and Straining Device



No. 530 Turner Foot Pump

Turner Auto Carburetter—4 Sizes

Turner Polished Bronze Foot Treadles (Single and Double)



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CONTINENTAL Motor Mfg. Co., Muskegon, Mich. (see page 111).

GEARLESS Transmission Co., Rochester, N. Y.

GIES Gear Co., 345-347 Bellevue Ave., Detroit, Mich.

N. Y. Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.

SNOW & Petrelli Mfg. Co. (The), New Haven, Conn.

TUTTLE Mfg. Co., H. A., So. Norwalk, Conn.

GEARS (Transmission)

AMERICAN Die & Tool Co., Reading, Pa.

BELDEN Auto Transmission Co., 1005 Bessemer Bldg., Pittsburg, Pa.

BENDIX Co. (The), 4212 State St., Chicago, Ill. (see page opposite).

BEVERLY Mfg. Co., Beverly, Mass.

BOSTON Gear Works, Norfolk Downs, Mass.

BROWN-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y. (see page 91).

BULTMAN & Co., F. H., 131 Viaduct, Cleveland, O.

CARLYLE & Johnson Machine Co., Hartford, Conn.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich. (see page 111).

CURRIER, Gardner & Bullis, Coudersport, Pa.

FORT Wayne Gear Co., Fort Wayne, Ind.

GARFORD Co. (The), Elyria, O.

GEARLESS Transmission Co., Rochester, N Y.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

KALB & Berger Mfg. Co., Inc. (The), 1565 Broadway, New York.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LAUTH & Co., J., 528 Elston Ave., Chicago, Ill.

LEE Mfg. Co. (The), South Park, Port Huron, Mich.

LONG Arm System Co., Cleveland, O.

MANNING Transmission Co., E. H., Elkhart, Ind.

MILWAUKEE Auto. Engine & Supply Co., 706 Winnebago St., Milwaukee, Wis.

MILWAUKEE Motor Co., Milwaukee, Wis.

MUNCIE Auto Parts Co., Muncie, Ind.

MUNCIE Gear Works, 801 E. Charles St., Muncie, Ind.

NEW York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.

NORTHWAY Motor & Mfg. Co., Maybury Grand Ave., Detroit, Mich.

PHILLIPS Motor Wks., W. L., 405 Tacoma Bldg., Chicago, Ill.

PURITAN Machine Co., 12 Gratiot Ave., Detroit, Mich.

REDINGTON, F. B., & Co., 107-109 S. Sangamon St., Chicago, Ill.

ROSS Gear & Tool Co., Lafayette, Ind.

SHATTUCK Co., W. P., 2125 Girard Ave., So. Minneapolis, Minn.

SINTZ, Guy L., Fulton and Front Sts., Grand Rapids, Mich.

SMITH Co., A. O., Milwaukee, Wis.

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page 63).

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

SYRACUSE Gear Co., Syracuse, N. Y.

TREBERT Gas Engine Co., 163 165 Main St. W., Rochester, N. Y.

VIRTUE & Pound Mfg. Co., Owatonna, Minn.

WARNER Gear Co., Muncie, Ind.

WESTERFIELD Motor Co. (The), 1531 Main St., Anderson, Ind.

WESTERN Motor Co. (The), Logansport, Ind.

GEAR WHEELS (Metal)

ADAPT Machinery Co. (The), 17th St. and Wabash Ave., Chicago, Ill.

ARTHUR Co. (The), 188 Front St., N. Y. City.

BOSTON Gear Works, Norfolk Downs, Mass.

BULTMAN, F. H., & Co., 131 Viaduct, Cleveland, O.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

CULLMAN Wheel Co., 1030 Dunning St., Chicago, Ill. (see page 91).

DETROIT Screw Works, Detroit, Mich.

FELLOWS Gear Shaper Co. (The), Springfield, Vt.

MUNCIE Auto Parts Co., Muncie, Ind.

NEW Process Rawhide Co., Syracuse, N. Y. (see page 113).

NUTTALL, R. D., Co., Fayette St. and Garrison Way, Pittsburg, Pa.

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page 63).

VAN Dorn & Dutton Co. (The), 2714 E. 79th St., Cleveland, O.

WARNER Gear Co., Muncie, Ind.

WIDMER Machine Works, 43-47 Fort St., E., Detroit, Mich.

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

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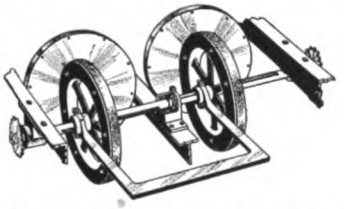

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HORSBURGH & Scott Co., Cleveland, O.

MUNSON, Chas., Belt Co., 88 Franklin St., Chicago, Ill.

NEW Process Rawhide Co., Syracuse, N. Y. (see page 113).

PICROME Hide Co., Syracuse, N. Y.

SYRACUSE Rawhide Mfg. Co., Niagara and Shonnard Sts., Syracuse, N. Y.

WIDMER Machine Wks., 43-47 Fort St., E., Detroit, Mich.

GENERATORS (Electric)

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 105).

ECK Dynamo Motor Co., Belleville, N. J.

EDDY Electric Mfg. Co. (The), Windsor, Conn.

ELBRIDGE Electric Co., Elbridge, N. Y.

GENERAL Electric Co., Lynn, Mass.

LAMB Electric Co., 31 Canal St., Grand Rapids, Mich.

MILWAUKEE Electric Co., Milwaukee, Wis.

NEW England Motor Co., Liberty Square, Lowell, Mass. (see page 35).

ROTH Bros. & Co., 27-29 S. Clinton St., Chicago, Ill.

SPRAGUE Electric Co., 527 W. 34th St., N. Y. City.

STERLING Electric Motor Co., Dayton, O.

WAGNER Electrical Mfg. Co., St. Louis, Mo.

WESTINGHOUSE Co., 10 Bridge St., N. Y. City.

GLASS FRONTS (See Wind Shields)

GLOVES AND GAUNTLETS

ALLEN & Son, John C., Gloversville, N. Y.

AMERICAN Glove Co. (The), 18 Churchill St., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co. (The), 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BELOIT Glove & Mitten Co., 217 Grand Ave., Beloit, Wis.

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

CLARK Glove Co., Peabody, Mass.

CROSBY, Frisian, Fur Co., 116 Mill St., Rochester, N. Y.

DEMMERLE & Co., 248 W. 23d St., N. Y. City.

DETROIT Leather Specialty Co., Detroit, Mich. (see page opposite).

EISENDRATH Glove Co., Armitage and Elston Ave., Chicago, Ill.

ELLSWORTH & Thayer Mfg. Co., Milwaukee, Wis.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

HANSEN, O. C., Mfg. Co., 356 E. Water St., Milwaukee, Wis.

HEAGLE, James, Cor. First Ave. and Market St., Johnstown, N. Y.

KIBBE, C. S., Batavia, N. Y.

LILLEY, M. C., & Co., Columbus, O.

MESINGER, H. & F. Mfg. Co., 1801-1803 First Ave., N. Y. City.

MORAWETZ Co. (The), Milwaukee, Wis.

MORRISON, McIntosh & Co., 63 Broad St., Grinnell, In. (see page opposite).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (hee page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

PONTIAC Knitting Co., Pontiac, Mich.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co., (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

RIPON Knitting Wks., Ripon, Wis.

SAKS & Co., Broadway and 34th St., N. Y. City.

SYRACUSE & Eldridge Gloves Co., 924 S. Salina St., Syracuse, N. Y.

GOGGLES (See Eye Shields)

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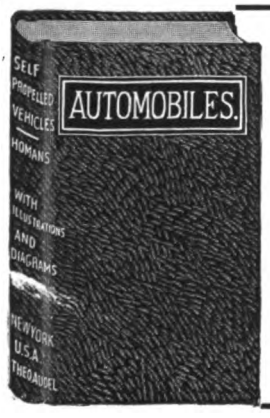

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HOLMES Fibre Graphite Co., 5155 Wakefield St., Philadelphia, Pa.

NATIONAL Cement & Rubber Mfg. Co., 3053-59 Monroe St., Toledo, O.

OBERMAYER Co. (The) S., Cincinnati, O.

UNITED States Graphite Co., Saginaw, E. S., Mich.

WISCONSIN Graphite Co., Allegheny, Pa.

GREASE

ANNIS Oil Co., N. L., 139 Potomac Ave., Buffalo, N. Y.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BESLEY & Co., C. H., 15-21 South Clinton St., Chicago, Ill.

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

COLUMBIA Lubricants Co. of New York, 78 Broad St., New York (see page 121).

DOWNING Grease Co., 14 Waltham St., Boston, Mass.

EAGLE Oil & Supply Co., 104 Broad St., Boston, Mass.

EMERY Mfg. Co., Bradford, Pa.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FISKE Bros. Refining Co., 13-15 Old Slip, New York (see page opposite).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

HARRIS, A. W., Oil Co., 330 S. Water St., Providence, R. I. (see back cover).

KELLOGG, E. H. Co., 243-244 South St., New York City.

KEYSTONE Lubricating Co., 20th and Allegheny Ave., Philadelphia, Pa.

MILLER'S Sons, Wm. P., 73-79 Third St., Long Island City, N. Y. (see page opposite).

MONARCH Mfg. Co., Toledo, O.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NATIONAL Cement and Rubber Mfg. Co., Toledo, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

N. Y. and N. J. Lubricant Co., 14 Church St., New York City.

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

NORTHROP Lubricating Oil Co., 308 N. Commercial St., St. Louis, Mo.

PARAGON Refining Co. (The), Toledo, O.

PHILA. Grease Mfg. Co., The Bourse, Philadelphia, Pa.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

RELIANCE Oil & Grease Co., 12 S. Water St., Cleveland, O.

Sheppard, W. S., 22 Lawrence St., Newark, N. J. (see page 123).

SULLIVAN Oil Co., Chicago, Ill.

WISCONSIN Graphite Co., Allegheny, Pa.

YOUNG, Orlando W., 180 Freylinghuysen Ave., Newark, N. J. (see page 211).

GREASE CUPS

AMERICAN Injector Co., Detroit, Mich.

AMERICAN Lubricator Co., Detroit, Mich.

BESLEY & Co., Chas. H., 15-21 S. Clinton St., Chicago, Ill.

BOWEN Mfg. Co., Auburn, N. Y.

DETROIT Lubricator Co., Lincoln Ave. and G. T. R. R., Detroit, Mich.

ERIE Stamping & Mfg. Co., Erie, Pa.

ESSEX Brass Co., G. B., 480 Franklin St., Detroit, Mich.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

LUNKENHEIMER Co. (The), Cincinnati, O.

SPENCE Mfg. Co., 279 Park St., Milwaukee, Wis.

THIEM Mfg. Co., Minneapolis, Minn.

TUCKER, C. F., Hartford, Conn.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WILLIAM Powell Co. (The), 2525-31 Spring Grove Ave., Cincinnati, O.

WILLIAMS Valve Co., D. T., 904-910 Broadway, Cincinnati, O.

WINKLEY Co. (The), Detroit, Mich.

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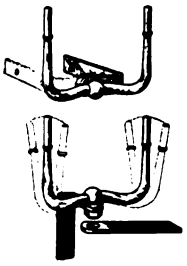

Furnished with a strong Norway iron strap which can be bent cold in any vise to give the right offset for the machine for which it is wanted. Or we will furnish it offset for you if you so desire.

We furnish this Bracket with fork and nut brass plated, or we can furnish it all in black. We solicit a trial or sample order from every automobile dealer in the country, and assure you that small orders will be promptly and properly taken care of.

Brackets furnished in regular sizes, which are 7 inches and 8½ inches from end to end of fork. Any other widths made to order.

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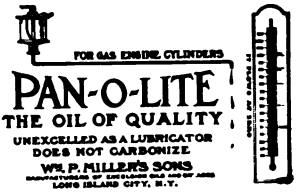

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BAEDER, Adamson & Co., 67 Beekman St., N. Y. City.

BENTLEY Hair Co., Joseph, Methuen, Mass.

MITCHELL, P. R. Co. (The), Spring Grove & Harrison Aves., Cincinnati, O.

HAMPERS

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

ATLAS Mfg. Co., Hampton, N. H.

AUTOMOBILE Equipment Co. (The), 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BAILIE Basket Co., 85-87 Hudson St., Boston, Mass.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BOSTON Mat & Basket Co., 62 Fulton St., Boston, Mass.

BURLINGTON Basket Co., Burlington, Ia.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

HEYWOOD Bros. & Wakefield Co., 174 Portland St., Boston, Mass.

M. & A. Basket Co., 239 E. 27th St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page opposite).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

RATTAN Mfg. Co., 522 State St., New Haven, Conn.

SCHERER, Williams Co., 30 Lewis Wharf, Boston, Mass.

HEADLIGHTS (See Lamps)

HEATERS (Carriage)

CHICAGO Auto Heater Co., 285 N. State St., Chicago, Ill.

CHICAGO Flexible Shaft Co., La Salle Ave. and Ontario St., Chicago, Ill.

LEHMAN Bros., 10 Bond St., N. Y. City.

MOTOR Car Heater Co., 21 Quincy St., Chicago, Ill.

NOVELTY Mfg. Co., Jackson, Mich.

OLMSTED & Son, H. R., 413 S. Clinton St., Syracuse, N. Y.

PROGRESSIVE Mfg. Co., Pana, Ill.

STANDARD Stamping Co., Marysville, O.

HEATERS (Feed Water)

KILBURN, Edwin, Spring Valley, Minn.

NATIONAL Pipe Bending Co., New Haven, Conn.

NORRIS Mfg. Co., 27 Western Ave., Cambridge, Mass.

RANLET Automobile Co., St. Johnsbury, Vt.

WHITLOCK Coil Pipe Co., Hartford, Conn. (see page 89).

HEATERS (Torch)

FOSTER & Brown, Westbrook, Me.

MORAN Flexible Steam Joint Co., Louisville, Ky.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WALLACE, W. M., 616 18th St., N. W., Washington, D. C.

HOLDERS (Watch)

COWLES & Co., C., New Haven, Conn.

ENGLISH & Mersick Co., New Haven, Conn.

RUMPP & Sons, C. F., Philadelphia, Pa.

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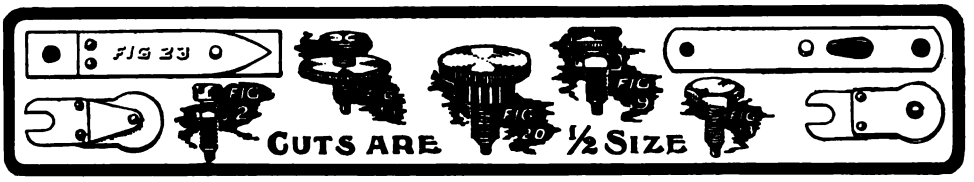

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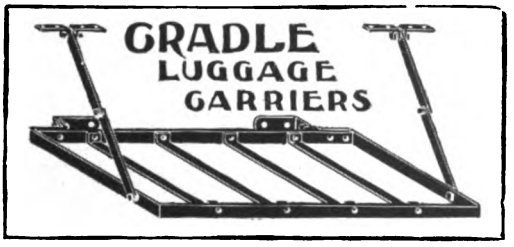

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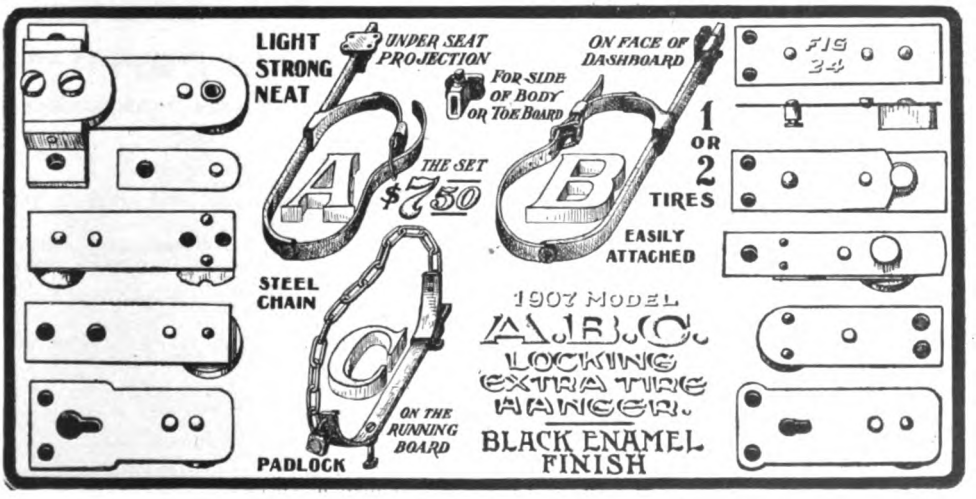

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HOODS

A-Z Co. (The), 527 W. 56th St., N. Y. City.

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 133).

DETROIT Auto Specialty Co., 909-911 Greenwood Ave., Detroit, Mich. (see page opposite).

DIAMOND Stamped Ware Co., Detroit, Mich.

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

FEDDERS Mfg. Works, Buffalo, N. Y. (see page 133).

HAYES Mfg. Co. (The), 360-370 Maybury Ave., Detroit, Mich. (see page 43).

KELLS, W. J., Mfg. Co., 62-66 Van Winkle Ave., Jersey City, N. J.

KINSEY Mfg. Co., Dayton, O.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

LONG-Turney Mfg. Co., Rome, N. Y.

MAYO Radiator Co. (The), New Haven, Conn. (see page opposite).

MOORE & Munger Co., 602 W. 52d St., New York.

MULLINS Co. (The) W. H., Salem, O.

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

PURSELL Mfg. Co., P. M., 802 Beecher St., Indianapolis, Ind. (see page opposite).

SPRINGFIELD Metal Body Co., 397 Birnie Ave., Brightwood, Mass. (see page 169).

WHITLOCK Coil Pipe Co. (The), Hartford, Conn. (see page opposite).

WRIGHT Cooler & Hood Mfg. Co., 335 Wabash Ave., Chicago, Ill.

HORNS

ACORN Brass Mfg. Co., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co. 264 Jefferson Ave., Detroit, Mich. (Dealers bers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers, and Jobbers) (see page 63).

AUTOMOBILE Supply Mfg. Co., 139 Emerson Place, Brooklyn, N. Y.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co. 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

FUNKE, A. H., 83 Chambers St., New York.

GLEASON-Peters Air Pump Co., Mercer and Houston Sts., N. Y. City.

HUTCHINSON Electric Horn Co., N. Y. City.

MANHATTAN Screw & Lamp Co., 7th Ave, and 11th St., N. Y. City.

McPHILLIPS Horn Mfg. Co., 255 Jefferson Ave., Detroit, Mich.

MILLER, Charles E., 97-101 Reade St., New York (Importer).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

RILEY-Klotz Mfg. Co., 17 Mulberry St., Newark, N. J.

ROSS Engineering Co., 97 S. Clinton St., Chicago, Ill.

RUBAY, Leon, 136 W. 38th St., N. Y. City (Importers).

SCHOENING, M. E., 369 Broadway, New York City (Importers).

STEVENS & Co., 99 Chambers St., N. Y. City.

STEWART & Clark Mfg. Co., 514 Diversey Blvd., Chicago, Ill. (see page 93).

20TH Century Mfg. Co., 19 Warren St., New York.

VESTA Accumulator Co., 1334 Michigan Ave., Chicago, Ill.

WEISS, Louis T., 286-90 Taaffe Place, Brooklyn, N. Y.

HORNS (Exhaust)

APPLIANCE Mfg. Co., 70-86 West Jackson Blvd., Chicago, Ill. (see page 189).

GABRIEL Horn Mfg. Co., 934 Hamilton Ave., N. E., Cleveland, O.

GAS Engine Whistle Co., 1123 Broadway, N. Y. City.

GRAY-Hawley Mfg. Co., 605-609 Fort St., W., Detroit, Mich.

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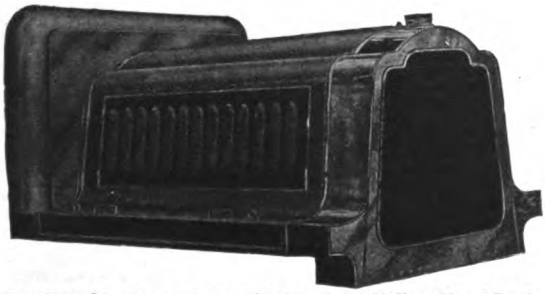

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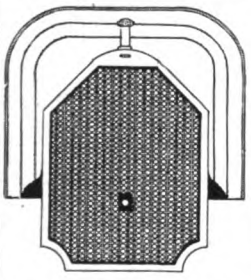

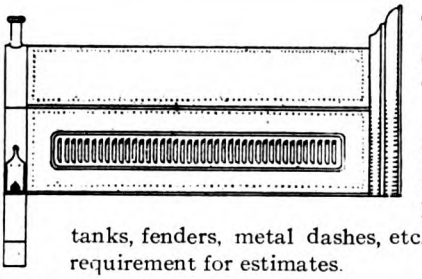

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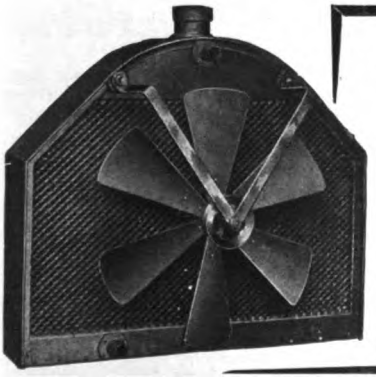

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KEASBY & Mattison Co., Ambler, Pa.

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DESCHLER, August, 18-20 East Water St., Chillicothe, O.

DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapolis, Ind. (see page 177).

GARFORD Co. (The), Elyria, O.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

HESS-Bright Mfg. Co., 619 Penna. Bldg., Philadelphia, Pa.

JAMESVILLE Mfg. Co., Jamesville, N. Y.

LASHAWAY Car & Wheel Co., East Brookfield, Mass.

MUNCIE Auto Parts Co., Muncie, Ind.

SMITH Co., A. O., Milwaukee, Wis.

STANDARD Roller Bearing Co., 48th & Girard Ave., Philadelphia, Pa.

STANDARD Welding Co. (The) Cleveland, O.

TIMKEN Roller Bearing Axle Co., Canton, O.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WESTON-Mott Co., Flint, Mich.

HUB CAPS

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 45).

CROSBY Co. (The), Buffalo, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

IMPERIAL Brass Mfg. Co., 257 S. Jefferson St., Chicago, Ill.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

NIAGARA Falls Brass Works, Inc., Niagara and Virginia Sts., Buffalo, N. Y. (see page 55).

STANDARD Welding Co. (The) Cleveland, O.

TORREY Roller Bushing Works, Bath, Me.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WORCESTER Pressed Steel Co., Worcester, Mass.

HUB FLANGES

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 45).

CROSBY Co. (The), Buffalo, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

HYDRAULIC Pressed Steel Co., Cleveland, O. (see back cover).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

STANDARD Welding Co. (The) Cleveland, O.

WORCESTER Pressed Steel Co., Worcester, Mass.

HYDROMETERS

ADAMS, A. L., 45 Salem St., Worcester, Mass.

AMERICAN Thermo-ware Co., 16 Warren St., New York.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

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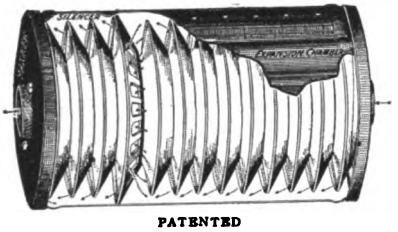

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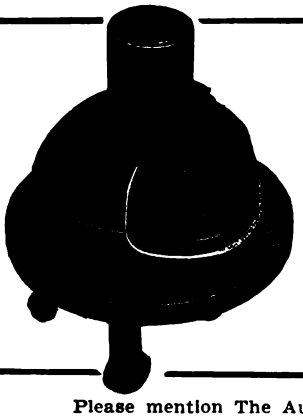

BROWN-LIPE GEARS

Differentials (Bevel or Chain Drive)
Steering (Back-Lock)
Sliding Gear Transmissions

BROWN-LIPE GEAR CO.
SYRACUSE, N. Y.

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EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

GREINER, Emil, 45 Cliff St., New York.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

POPE Mfg. Co., Hartford, Conn. (Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Importers) (see page 127).

SCIENTIFIC Shop (The), 1230 Monon Bldg., Chicago, Ill.

TAYLOR Bros. Co., Rochester, N. Y.

VUILLE, Chas. A., Huntington, Pa.

IGNITION CABLE (See Wire, Insulated)

IGNITION DYNAMOS (See Magnetos and Ignition Dynamos)

INDICATORS (Gasoline Tank) (See Gauges, Gasoline Tank)

INDICATORS (Speed and Distance)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

ARTIZAN Brass Co., 204 Lincoln Park Bldg., Chicago, Ill.

AUTO Improvement Co., 316 Hudson St., New York City.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BULLARD, J. H., 777 State St., Springfield, Mass.

DAVIS, S. H. & Co., 68 Portland St., Boston, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

HICKS Speed Indicator Co., 1384 Bedford Ave., Brooklyn, N. Y.

HOFFECKER Speed & Mile Register Co., Park Square Motor Mart, Boston, Mass.

JONES, J. W., 127 W. 32d St., N. Y. City.

JONES, W. H., 134 Waverley Ave., Newton, Mass.

LITTLEFIELD Mfg. Co., W. S., 134 Eliot St., Boston, Mass.

LORING, E. J., Somerville, Mass.

MILLER Speedometer Co., 97 Reade St., N. Y. City.

MONITOR Speed Recorder Co., 274 Pearl St., Cambridge, Mass.

MOTOR Car Specialty Co., 112 N. Broad St., Philadelphia, Pa.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page [illegible]).

OLIVER Instrument Co., Cor. Hennepin and 7th Sts., Minneapolis, Minn. (see page 73).

POPE Mfg. Co., Hartford, Conn (Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

SMITH Mfg. Co., R. H., Springfield, Mass. (see page 153).

STEWART & Clark Mfg. Co., 514 Diversey Blvd., Chicago, Ill. (see page opposite).

VEEDER Mfg. Co., Hartford, Conn.

WARNER Instrument Co., 403 Roosevelt Ave., Beloit, Wis.

WEBB Mfg. Co., 60 Shipman St., Newark, N. J.

WILLYOUNG Appliance Co., Ludlow Station, Yonkers, N. Y.

WINCHESTER Speedodometer Co., Inc., 1557 Broadway, N. Y. City.

INJECTORS (See Lubricators)

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are making a "big hit" with those who have used other instruments. The remarkable steadiness of the pointer under the severest road conditions is proving a revelation to all who use them. A beautiful piece of mechanism and a real truly, sure enough unbreakable flexible shaft are features that appeal to people who look into these matters.

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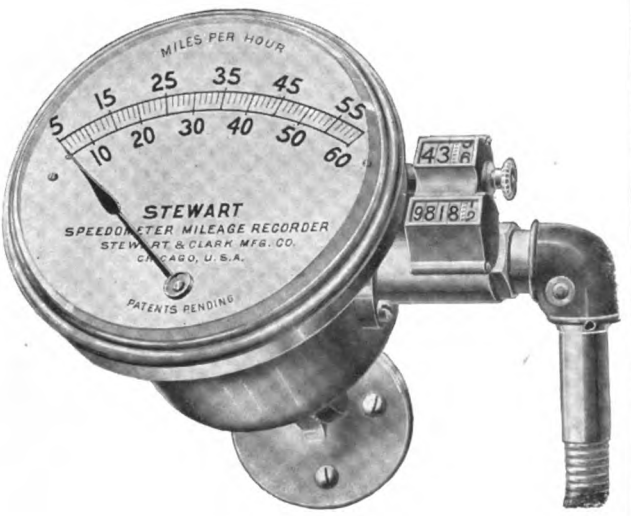

Stewart & Clark Mfg. Company

514 Diversey Blvd.
Chicago

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INSULATORS (See Mica Insulators, Porcelain Insulation, Wire, Insulated)

IRON AND STEEL (Angle, Channel and Tee)

AMERICAN Steel Hoop Co., Pittsburg, Pa.

CAMBRIA Steel Co., Philadelphia, Pa.

CARNEGIE Steel Co., Pittsburg, Pa.

PENNSYLVANIA Steel Co., Steelton, Pa.

REPUBLIC Iron & Steel Co., Chicago, Ill.

IRON AND STEEL (Bar)

AM. Iron & Steel Mfg. Co., Lebanon, Pa.

AMERICAN Steel Hoop Co., Pittsburg, Pa.

BRAEBURN Steel Co., Braeburn, Pa.

CAMBRIA Steel Co., Philadelphia, Pa.

CARNEGIE Steel Co., Pittsburg, Pa.

CRUCIBLE Steel Co. of Am., Pittsburg, Pa.

DIAMOND State Steel Co., Wilmington, Del.

LOCKHART Iron & Steel Co., McKees Rocks, Pa.

LOGAN Iron & Steel Co., Burnham, Pa.

NATIONAL Steel Co., Pittsburg, Pa.

PASSAIC Steel Co., Paterson, N. J.

PENNSYLVANIA Steel Co., Steelton, Pa.

PHOENIX Iron Co., Phoenixville, Pa.

PITTSBURG Steel Shafting Co., Braddock, Pa.

REPUBLIC Iron & Steel Co., Chicago, Ill.

IRON AND STEEL (Sheet)

AMERICAN Sheet Iron Co., Phillipsburg, N. J.

AMERICAN Sheet Steel Co., N. Y. City.

BASSETT-Pressley Co., Cleveland, O.

CANONSBURG Iron & Steel Co., Pittsburg, Pa.

McCULLOUGH Iron Co., Wilmington, Del.

MARYLAND Sheet & Steel Co., Cumberland, Md.

TAYLOR Co., N. & G., 308 Chestnut St., Philadelphia, Pa.

WAITE, Ranlet & Co., 80-82 Broad St., Boston, Mass.

WAUKESHA Sheet Steel Co., Waukesha, Wis.

YOUNGSTOWN Iron, Sheet & Tube Co., Youngstown, O.

JACKS

ANDERSON Pole & Shaft Co., Anderson, Ind.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOBED Co. (The), Boston Mass. (Automatic Lift).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

AUTO Supply Co., Binghamton, N. Y.

BARTH Mfg. Co., Milwaukee, Wis.

BATAVIA Clamp Co., Batavia, N. Y.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BICYCLE Step Ladder Co. (The), 63 Randolph St., Chicago, Ill.

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page opposite).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BUCKEYE Jack Mfg. Co., Louisville, O.

CAPITAL Auto Co., Indianapolis, Ind.

COOK'S Standard Tool Co., Kalamazoo, Mich.

COVERT Mfg. Co., West Troy, N. Y.

DUFF Mfg. Co., Pittsburg, Pa.

EUREKA Mower Co., Utica, N. Y.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FERODOWILL Mfg. Co., St. Paul, Minn.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

GARLICK Auto. Prop Co., Madison Ave. and Broadway, Paterson, N. J.

GLOBE Jack Co., Philadelphia, Pa.

JERSEY Brake Co., 93 Green St., Newark, N. J.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

MAXWELL, L. R., & Co., Cedar Rapids, Ia.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

OLIVER Mfg. Co., 213 So. Desplaines St., Chicago, Ill.

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This is an illustration of our No. 3 SINGLE ACTING AUTO JACK, made from Malleable Iron, with Steel Rack Bars, therefore specify Leader Jacks and you will not be deceived.

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PATTERSON, Gottfried & Hunter, Ltd., 146-150 Centre St., N. Y. City.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

ROTH Jack and Tool Co., 68 William St., N. Y. City.

SHAWVER Co., Springfield, O.

SMITH & Heminway, 296 Broadway, N. Y. City.

STANDARD Tool Co., 432 Harrison St., Kalamazoo, Mich. (see page 95).

TRENTON Malleable Iron Co., Trenton, N. J.

U. S. JACK Co., 1025 W. Lake St, Chicago, Ill.

UTILITY Co. (The), 332 Broadway, New York.

WHIPPLE, R. W., 169 State St., Binghamton, N. Y.

JOINTS (Flexible)

ASHLEY Machine Works, 714 University Ave., Rochester, N. Y.

BAUSCH Machine Tool Co., Wason Ave., Springfield, Mass.

BLOOD Bros. Machine Co., Kalamazoo, Mich.

BOSTON Gear Works, Norfolk Downs, Mass.

CALDWELL-Wilcox Co., Newbury, N. Y.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 69).

COATES Clipper Mfg. Co., Worcester, Mass. (see page 47).

GRAY & Prior Machine Co. (The), Hartford, Conn.

HARTFORD Auto Parts Co., Hartford, Conn.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

LAIB Co., Louisville, Ky.

LEHMAN, I., 61 Middle St., Cleveland, O.

MORAN Flexible Joint Co., 149 3d St., Louisville, Ky.

MUNCIE Auto Parts Co., Muncie, Ind.

MUTUAL Machine Co., 25 Wells St., Hartford, Conn.

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill. (see page 109).

SPICER Universal Joint Mfg. Co., 15 Madison Ave., Plainfield, N. J. (see page opposite).

VANDERBEEK Tool Wks., Hartford, Conn.

LAMP BRACKETS

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

DOUGLAS & Lomason Co., Detroit, Mich.

KELLY Handle Bar Co., Cleveland, O.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (see page 87).

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 175).

STANDARD Welding Co. (The), Cleveland, O.

LAMP BRACKETS (Adjustable)

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (ee page 69).

IMPERIAL Brass Mfg. Co., 251 So. Jefferson Ave., Chicago, Ill.

NORTHWAY, Thomas J., 102 Exchange St., Rochester, N. Y. (see page oppo-85).

PYLE Mfg. Co., 2211 Park Ave., Indianapolis, Ind.

RANDS, Wm. C., 51 Macomb St., Detroit, Mich.

LAMP COVERS

EMPIRE Rubber Co., 115-117 Worth St., N. Y. City.

GIFFORD & Son, John A., 25 Park Place, N. Y. City.

GILBERT Mfg. Co., 70-80 Center St., New Haven, Conn. (see page 163).

LONDON Auto Supply Co., 1235 Michigan Ave., Chicago, Ill. (see page 39).

MYERS Auto Top Co., Dayton, O. (see page 135).

NATHAN Novelty Mfg. Co., N. Y. City.

O'NEILL-Ollier Co., 1532-34 Michigan Ave., Chicago, Ill.

VEHICLE Apron and Hood Co., Columbus, O.

WARNER Pole and Top Co., 1655 Central Ave., Cincinnati, O.

WILEY & Son Co., Wm. H., Box 30, Hartford, Conn. (see page 165).

LAMPS

ADAMS & Westlake Co. (The), 110 Ontario St., Chicago, Ill.

AMERICAN Auto Brass Co., 181 W. Maple St., Columbus, O.

AMERICAN Lamp Co., 255 Jefferson Ave., Detroit, Mich.

AMERICAN Lamp Wks., 62 West 43d St., N. Y. City.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

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SPICER UNIVERSAL JOINTS

The Standard for Strength and Durability

51 TYPES and SIZES

Only the very best material is used—Steel Drop Forgings being used for all parts under stress of Power Transmission. All bearings are hardened and accurately ground, and all parts are interchangeable. Lubrication is practically perfect; joints will outwear the rest of the car.

Every Way the Best Joint on the Market

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Dust-Proof, Oil-Tight

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Spicer Universal Joint Co., 15 Madison Ave. Plainfield, N. J.

SPICER SPICER

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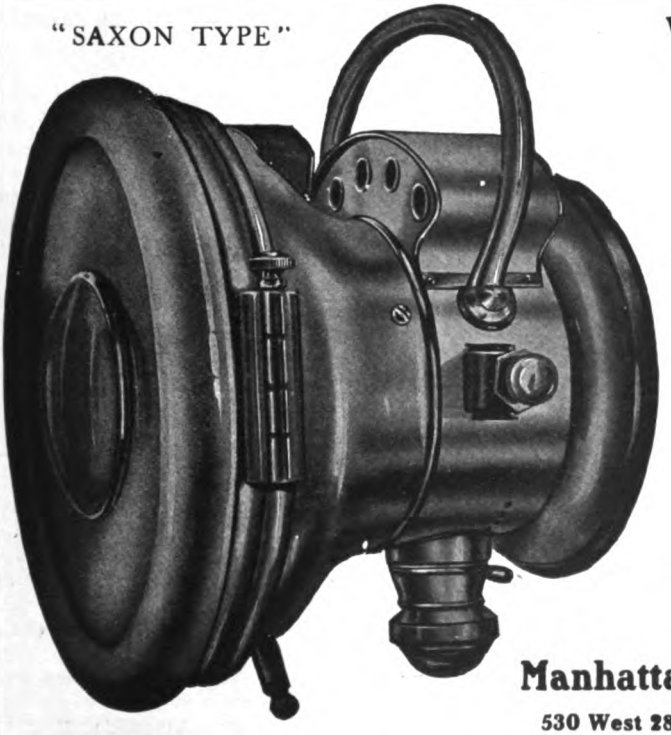

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QUALITY, STYLE
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RIGHT PRICES

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Special Prices to Jobbers and Dealers

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LAMPS (Continued)

ATWOOD Mfg. Co., Amesbury, Mass.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BADGER Brass Mfg. Co., Kenosha, Wis.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BROWN Mfg. Co., Columbus, O.

CHICAGO Auto Lamp Works, 71 W. Jackson Blvd., Chicago, Ill.

CORCORAN Lamp Co. (The), 1712 Reading Rd., Cincinnati, O. (see page opposite).

COWLES, C. &. Co., New Haven, Conn.

DAYTON Mfg. Co., 2240 E. 3d St., Dayton, Ohio.

DIETZ, R. E. Co., 33 Laight St., N. Y. City.

DU BOIS Searchlight Co., 220 Broadway, N. Y. City.

EDMUNDS & Jones, 315 Riopelle St., Detroit, Mich.

ENGLISH & Mersick Lamp & Fdry. Co., New Haven, Conn.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

FUNKE, A. H., 83 Chambers St., N. Y. City.

GRAY & Davis, Amesbury, Mass.

GRAY, Peter & Sons,, 88-90 Union St., Boston, Mass.

HAM Mfg. Co., C. T., 137 Oak St., Rochester, N. Y. (see page opposite).

HINE-Watt Mfg. Co., 60 Wabash Ave., Chicago, Ill. (see page 201).

LOCKWOOD Co. (The), 34 Mechanic St., Newark, N. J.

MANHATTAN Brass Co., 328 E. 28th St., N. Y. City.

MANHATTAN Lamp Works, 530 W. 28th St., N. Y. City (see page 97).

MANHATTAN Screw & Lamp Co., 7th Ave. and 11th St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

N. Y. Coach & Auto Lamp Co., 794-798 10th Ave., New York.

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

PYLE Mfg. Co., 2211 Park Ave., Indianapolis, Ind.

ROSE Mfg. Co., 910 Arch St., Phila., Pa.

RUSHMORE Dynamo Wks., Plainfield, N. J.

SCOVILLE & Peck Co. (The), New Haven, Conn.

STANDARD Lamp Mfg. Co., 43 So. Canal St., Chicago, Ill., and Charlotte, Mich.

TWENTIETH Century Mfg. Co., 19 Warren St., New York, N. Y.

VESTA Accumulator Co., 1334 Michigan Ave., Chicago, Ill.

LAMPS (Water Glass)

DIETZ, R. E., Co., 33 Laight St., N. Y. City.

LEATHER

AMERICAN Oak Leather Co., Cincinnati, O.

AMERICAN Oak Leather Co., 176 South St., Boston, Mass.

ASHTABULA Hide & Leather Co., Astabula, Ohio.

CAFFREY Leather Co., M., Frelinghuysen Ave. and Meeker St., Newark, N. J.

CARR, F. S., 74 Pearl St., Boston, Mass. (see page 175).

CHASE Co., L. C., Boston, Mass. (see page 173).

CLEVELAND Tanning Co. (The), Jennings and Dennison Ave., S. W., Cleveland, O.

CRANDAL, Stone & Co., Binghamton, N. Y.

DIAMOND Leather Co., Peabody, Mass.

DUSENBURY, Louis, 86-88 Worth St., New York, N. Y.

HALSEY & Smith, J. H., Shipman and Springfield Ave., Newark, N. J.

HOWELL & Co., T. P., Newark, N. J.

LACKAWANNA Leather Co. (The), Hackettstown, N. J.

McCORMICK & Sons, E. H., Ave. C and Vanderpool St., Newark, N. J.

PATENT Leather Co. of America (The), Newark, N. J. (see page 175).

RADEL Leather Mfg. Co., Hamburg Place Road, Newark, N. J.

RASER Tanning Co., Ashtabula, O.

REILLY & Son Co., P., Newark, N. J.

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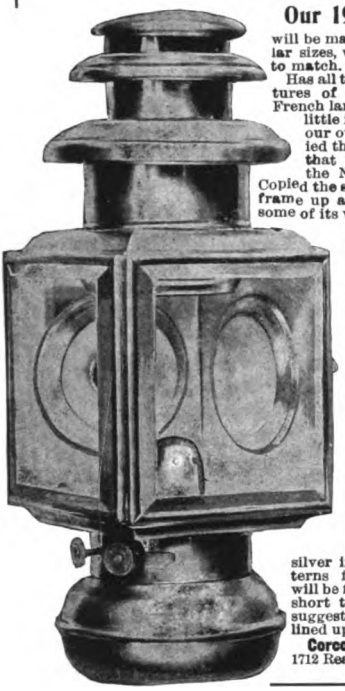
CORCORAN'S FRENCH SQUARE OIL SIDE LAMP



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Has all the desirable features of the high-priced French lamps, with a few little improvements of our own. Yes, we copied the French lamps that were shown at the New York Show. Copied the style and general frame up and improved on some of its weak points, and now CORCORAN is "IT" on square lamps if anybody should ask you. These French lamps were being priced at as high as $70.00 per pair at the New York Show, and we haven't got the nerve to ask $10.00 per pair. (We have an awfully low price—write.)

Elegant, well made, highly finished, and out of good, heavy-gauge brass. Solid brass outside, silver inside. Our patterns for these lamps will be finished in a very short time and would suggest that you get lined up for samples.

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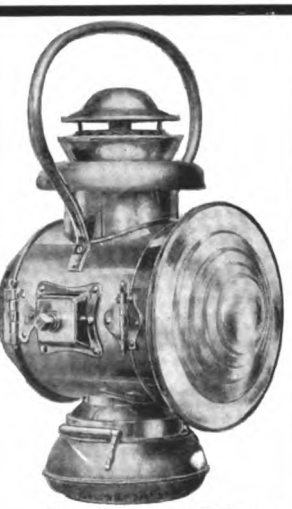

HAM'S TOURIST

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REX Imperial Leather Co., 16 Chappel St., Newark, N. J.

ROEHM & Davison, Detroit, Mich.

SMITH, Hugh, 210 Central Ave., Newark, N. J.

STANDARD Leather Co., Allegheny, Pa.

STENGEL & Rothschild, Kossuth and Borlin St., Newark, N. J.

TERWILLIGER-Stone Leather Co., 210 N. J. R. R. Ave., Newark, N. J.

WARD & Co., E. S., Newark, N. J.

WOLVERINE Leather Goods Co., 59 E. Fort St., Detroit, Mich.

LEATHER (Artificial)

BOSTON Artificial Leather Co., 12 E. 18th St., N. Y. City.

FABROKOID Co. (The), Newburgh, N. Y.

PANTASOTE Co. (The), 11 B'way, N. Y. City (see page 203).

LEATHER (Friction)

REPUBLIC Belting & Supply Co., Cleveland, O.

LEGGINGS (See Clothing)

LEVERS

AMERICAN & British Mfg. Co., Bridgeport, Conn.

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 119).

Cramp Ship & Eng. Building Co., Wm., Philadelphia, Pa.

GARFORD Co. (The), Elyria, O.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LEE Mfg. Co., Port Huron, Mich.

LIGHT Mfg. & Fdry. Co., Union and Queen Sts., Pottstown, Pa. (see page 57).

LONG Arm System Co., Cleveland, O.

MUNCIE Auto Parts Co., Muncie, Ind.

READING Automobile Co., Reading, Pa.

SMITH Co., A. O., Milwaukee, Wis.

SPACKE Machine Co. (The), F. W., Indianapolis, Ind. (see page 63).

STANDARD Welding Co. (The), Cleveland, O.

SYRACUSE Aluminum & Bronze Co., 530 Leavenworth Ave., Syracuse, N. Y. (see pages 27 and 53).

LICENSE NUMBERS (See Name Plates)

LOCKERS

ART Metal Construction Co., Jamestown, N. Y.

DARBY & Sons Co., Edward, 233 Arch St., Philadelphia, Pa.

MERRITT Co., 1045 Ridge Ave., Phila., Pa.

OHNSTRAND Metal Furniture Co., Jamestown, N. Y.

LUBRICANTS (See Oils and Greases)

LUBRICATORS

AMERICAN Injector Co., Detroit, Mich.

AMERICAN Lubricator Co., Detroit, Mich.

BAY State Stamping Co., Worcester, Mass.

BOWEN Mfg. Co., Auburn, N. Y.

CHARTER & Co., 46 Plymouth St., Chicago, Ill.

DETROIT Lubricator Co., Lincoln Ave. & G. T. R. R., Detroit, Mich.

DODGE Lubricator Co., 8 Waltham St., Boston, Mass.

ESSEX, G. B., Brass Co., 480 Franklin St., Detroit, Mich.

FRASSE Co. (The), 38 Cortlandt St., N. Y. City.

GREENE, Tweed & Co., 17 Murray St., N. Y. City.

HANCOCK Mfg. Co., 140 E. Erie St., Chicago, Ill. (see page 115).

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

IMPERIAL Brass Mfg. Co. (The), 257 So. Jefferson St., Chicago, Ill.

KINSEY Mfg. Co., Dayton, O.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LAVIGNE Mfg. Co., Detroit, Mich.

LEE Injector Co. (The), Port Huron, Mich.

LUNKENHEIMER Co. (The), Cincinnati, O.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page opposite).

MANZEL Bros. Co., 313 Babcock St., Buffalo, N. Y. (see page 113).

McRAE & Roberts Co., 227-235 Campbell Ave., Detroit, Mich.

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NEELY, Edward, 244 Wells St., Chicago, Ill.

NOERA Mfg. Co., Waterbury, Conn.

PEDERSEN Mfg. Co., 400-412 East 37th St., N. Y. City (see page opposite).

PENBERTHY Injector Co., Detroit, Mich.

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill. (see page 109).

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

WILLIAM Powell Co. (The), 2525 Spring Grove Ave., Cincinnati, O.

WILLIAMS Valve Co., D. T., 904-910 Broadway, Cincinnati, O.

WINKLEY Co. (The), Detroit, Mich.

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BEAMAN & Smith Co. (The), Providence, R. I.

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BLAKE & Johnson, Waterbury, Conn.

BROWN & Sharpe Mfg. Co., Providence, R. I.

BULLARD Mach. Co., Bridgeport, Conn.

CINCINNATI Electric Tool Co., 650-652 Evans St., Cincinnati, O.

CINCINNATI Milling Machine Co., Cincinnati, Ohio.

COLBURN Machine Tool Co., Franklin, Pa.

DEFIANCE Machine Works, Defiance, O.

EBERHARDT Bros. Machine Co., 66-68 Union St., Newark, N. J.

FELLOWS Gear Shaper Co. (The), Springfield, Vt.

FIELD Co., Chas. H., 230 Chestnut St., Providence, R. I.

FITCHBURG Machine Works, Fitchburg, Mass.

FORTIN Tool Co. (The), B. P., 227 N. Main St., Woonsocket, R. I.

FRANKLIN Portable Crane and Hoist Co., Franklin, Pa.

GARDAM & Son, Wm., 45-47 Rose St., New York.

GARVIN Machine Co., Spring & Varick Sts., New York.

GEOMETRIC Tool Co., Blake and Valley Sts., New Haven, Conn.

GISHOLT Machine Co., Madison, Wis.

GOULD & Eberhardt, 99 N. J. R. R. Ave., Newark, N. J.

HARTFORD Machine Screw Co., Hartford, Conn.

HEALD Mach. Co. (The), Worcester, Mass.

HILL, Clarke & Co., 156 Oliver St., Boston, Mass.

HISEY-Wolf Machine Co., Cincinnati, O.

KEMPSMITH Mfg. Co. (The), Milwaukee, Wis.

LAMB Electric Co., 32 Canal St., Grand Rapids, Mich.

LANDIS Tool Co., Waynesboro, Pa.

LAPOINTE Machine Tool Co., Boston, Mass.

NATIONAL-Acme Mfg. Co., Cleveland, O.

NILES-Bement-Pond Co., 111 Broadway, New York.

NORTON Grinding Co., Worcester, Mass.

NOVELTY Tufting Machine Co., 1200 Michigan Ave., Chicago, Ill.

PEDERSEN Mfg. Co., 400-412 East 37th St., N. Y. City (see page opposite).

POTTER & Johnson Machine Co., Pawtucket, R. I.

PRATT & Whitney Co. (The), Hartford, Conn.

PRENTISS Tool & Supply Co., 115 Liberty St., N. Y. City.

REED Co., Francis, 43 Hammond St., Worcester, Mass.

SMITH Co., William J., 424 State St., New Haven, Conn.

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STANDARD Tool Co., Cleveland, O.

STEPTOE Shaper Co. (The), Jno., Cincinnati, O.

VON WYCK Machine Tool Co., Cincinnati, Ohio.

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WHITON, D. E. Machine Co., New London, Conn.

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ASHLEY Machine Wks., 714 University Ave., Rochester, N. Y.

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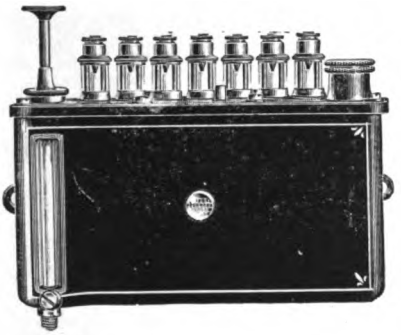

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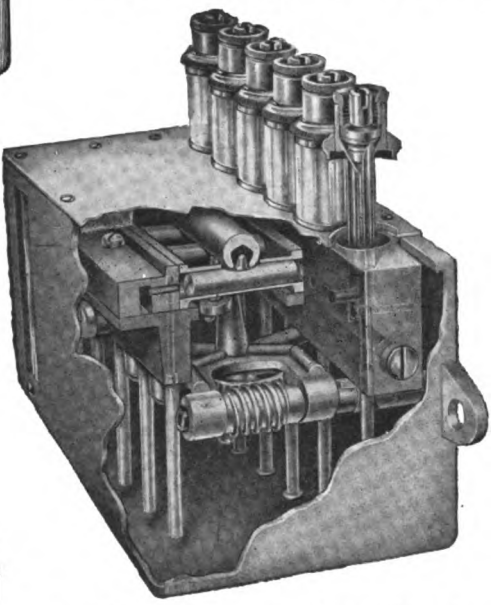

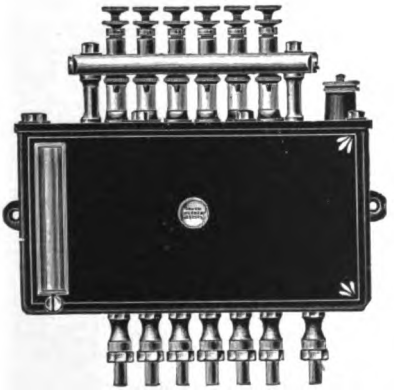

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DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapalis, Ind. (see page 61).

FERRO Machine & Foundry Co. (The), 115 Wade Bldg., Cleveland, O. (see page 191).

GENERAL Manufacturing Co., Elkhart, Ind.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 151).

HATCHER Auto Parts Co. (The), 140 Viaduct, Cleveland, O. (see page 5).

HOLT & Co., W. H., 95 Pine St., Providence, R. I.

JONES, Frank S., 629 Filbert St., Phila., Pa.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LEE Mfg. Co. (The), Port Huron, Mich.

LONG Arm System Co., Lakeside Ave. and 38th St., N. E., Cleveland, O.

MACHINERY Forging Co., Cleveland, O.

MASSNICK Mfg. Co., 1567 River St., Detroit, Mich.

McCUTCHEON Gear & Mfg. Co., 205 West South St., Indianapolis, Ind.

NATIONAL Engineering Co., Saginaw, Mich.

PATTINSON Mfg. Co., 48 Stanhope St., Boston, Mass.

PITTSBURG Brass Mfg. Co., Pittsburg, Pa.

PURITAN Machine Co., Detroit, Mich.

RHODE Island Machine Co. (The), Providence, R. I.

TAFT-Pierce Co., Woonsocket, R. I.

THROOP Perforating Co., 80 Terrace, Buffalo, N. Y.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WILLIAMS Valve Co., The D. T., 904-910 Broadway, Cincinnati, O.

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COATES Clipper Mfg. Co., Worcester, Mass. (see page 47).

MACHINES, TUFTING,
(Upholstering)

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CLIMAX Igniter Co., Amesbury, Mass.

CONSTANTINE Mfg. Co. (The), Constantine, Mich.

D.-K. Electric Co., 330 Market St., St. Louis, Mo.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page opposite).

DOW Portable Electric Co., Braintree, Mass.

DRAKE Electric Co., 1305 Michigan Ave., Chicago, Ill.

ELBRIDGE Electrical Mfg. Co., Elbridge, N. Y.

FISHER Co., A. W., South Bend, Ind.

GILBOUGH, B. G., 36 La Salle St., Chicago, Ill.

GOODSON Electric Ignition Co., Providence, R. I.

HERCULES Elec. and Mfg. Co., 709 Langsdale Ave., Indianapolis, Ind. (see page opposite).

HERZ & Co., 203-205 Lafayette St., N. Y. City.

HOLLEY Bros. Co., 675 Beaubien St., Detroit, Mich.

HOLTZER-Cabot Electric Co., Brookline, Mass.

IGNITER Appliance Co., 133 Central Ave., Cleveland, O.

KENDRICK & Davis, Lebanon, N. H.

K. W. Igniter Co., Section B, Whitney Bldg., Cleveland, O.

KENT Mfg. Works, Atwater, 50 N. Sixth St., Philadelphia, Pa. (see page 29).

KNOBLOCK-Heideman Mfg. Co., South Bend, Ind.

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MOTSINGER Device Mfg. Co., 36 Main St., Pendleton, Ind.

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OHIO Electric Works, 6304 Ellen Ave., N. W., Cleveland, O.

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REMY Electric Co., Anderson, Ind.

RUBAY, Leon, 140 W. 38th St. (Importer), N. Y. City.

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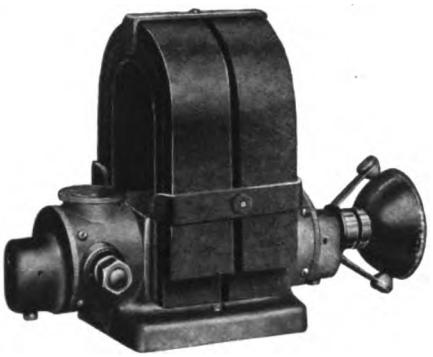

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SURVEY Map Co., 428 Lafayette St., N. Y. City.

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EMPIRE Rubber Co., Trenton, N. J.

GOODRICH, B. F., Co., Akron, O.

GOSHEN Rubber Works, Goshen, Ind.

HARTFORD Rubber Works Co., Hartford, Conn. (see page 161).

MANHATTAN Rubber Co., 18 Vesey St., N. Y. City.

MONARCH Rubber Co., 41 N. 7th St., Philadelphia, Pa.

NEW JERSEY Car Spring & Rubber Co., Wayne and Brunswick Sts., Jersey City, N. J.

PEERLESS Rubber Mfg. Co., 16 Warren St., N. Y. City.

VICTOR Rubber Co. (The), Springfield, O.

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ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page 51).

CLUM & Atkinson, Rochester, N. Y.

COLUMBIA Smelting & Refining Co., 307 Water St., N. Y. City.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

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GARDINER Metal Co., 454-56 W. Lake St., Chicago, Ill.

MAGNOLIA Metal Co., 113-115 Bank St., N. Y. City.

NEW Era Mfg. Co. (The), Kalamazoo, Mich.

PALMETTO Metal Co., 586 W. Lake St., Chicago, Ill.

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SHONBERG, I., 363 Hudson Ave., Brooklyn, N. Y.

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SYRACUSE Smelting Wks., 36th St. and 10th Ave., N. Y. City.

U. S. Bronze Co. (The), Cleveland, O.

WILDES, Thomas, 246 Water St., N. Y. City.

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

METALS (Brass and Copper)

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ANSONIA Brass & Copper Co., Ansonia, Conn.

BOKER & Co., Herman, 101 Duane St., N. Y. City.

BRIDGEPORT Brass Co., Bridgeport, Conn.

CHICAGO Brass Co., Kenosha, Wis.

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CRESCENT Phosphorized Metal Co., 2314-18 Wood St., Philadelphia, Pa.

DETROIT Copper & Brass Rolling Mills, Detroit, Mich.

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ELECTRIC Smelting & Aluminum Co. (The), Lockport, N. Y.

FRIES & Co., 89-93 Main St., Buffalo, N. Y.

HOLMES, Booth & Hayden Co. (The), Waterbury, Conn.

NEW HAVEN Copper Co., New Haven, Conn.

RANDOLPH-Clowes Co., Waterbury, Conn.

SYRACUSE Aluminum & Bronze Co., 530 Leavenworth Ave., Syracuse, N. Y. (see pages 27 and 53).

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CRAMP, Wm., & Sons Ship & Engine Building Co., Philadelphia, Pa.

HOMER Brass Works (Inc.), 231 Race St., Philadelphia, Pa.

LIGHT Mfg. & Fdry. Co., Union and Queen Sts., Pottstown, Pa. (see page 57).

MICHIGAN Brass & Fdry. Co. (The), 74-78 Fort St., E., Detroit, Mich.

NIAGARA Falls Brass Works (Inc.), Niagara and Virginia Sts., Buffalo, N. Y. (see page 55).

PHOSPHOR Bronze Smelting oC., Philadelphia, Pa.

PIONEER Brass Works, Indianapolis, Ind.

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REEVES & Son, Paul S., 1415 Catherine St., Philadelphia, Pa.

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CHICAGO Mica Co., Valparaiso, Ind.

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MICA Manufacturing Co., New York, N. Y.

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NORTH Carolina Mica Co., Boston, Mass.

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FIELD, Frank C., 605 N. St. Clair St., Toledo, O.

FINE, Horace E., Trenton, N. J.

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SALMAN & Co., John A., 17 Bromfield St., Boston, Mass.

STAFFORD Co., N., 67 Fulton St., N. Y. City.

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BROWNING Mfg. Co., Milwaukee, Wis.

BULLOCK Electric Co., Cincinnati, O.

C. & C. Electric Co., 143 Liberty St., N. Y. City.

CHAPMAN, W. H., Portland, Me.

EDDY Electric Mfg. Co. (The), Windsor, Conn.

ELECTRIC Vehicle Equipment Co., 20th & Montgomery Ave., Philadelphia, Pa.

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FT. WAYNE Electric Works, Ft. Wayne, Ind.

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PARSELL & Weed, 129-131 W. 31st St., N. Y. City.

RICHARDSON Engineering Co., Hartford, Conn. (see page 145).

ROTH Bros. & Co., 27-29 S. Clinton St., Chicago, Ill.

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STERLING Electric Motor Co., Dayton, O.

STOREY Motor & Electric Co., 321 Sussex St., Harrison N. J.

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BADECKER Gas Engine Co., Omaha, Neb.

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BEILFUSS Motor Co. (The), Lansing, Mich.

BENDIX Co. (The), 4212 State St., Chicago, Ill. (see page 81).

BEVERLY Mfg. Co., Beverly, Mass.

BOWEN Motor Co., 419 Auburn Ave., Buffalo, N. Y.

BRENNAN Motor Co., Syracuse, N. Y.

BRIGGS & Wade, Lynn, Mass.

BROWNELL-Trebert Co., 408 St. Paul St., Rochester, N. Y.

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CUSHMAN Motor Co., Lincoln, Neb.

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GRANT-Ferris Co., Troy, N. Y.

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HAYDEN Co., N. L., Columbus, O.

HOFFMAN Launch & Motor Works, W., 1253 North Halstead St., Chicago, Ill.

HOMAN, J. & E., 380 West Broadway, N. Y. City.

HOULE Motor Works, A. J., Holyoke, Mass.

HUBBARD Motor Co., Middletown, Conn.

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ILLINOIS Motor Works, 719-23 Sheffield Ave., Chicago, Ill.

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LAUTH & CO., J., 528 Elston Ave., Chicago, Ill.

LAZIER Gas Engine Co., 120 Main St., Buffalo, N. Y.

M'FARLAND Foundry & Machine Works, Trenton, N. J.

MAXWELL & Fitch Co., 218 So. Washington, St., Rome, N. Y.

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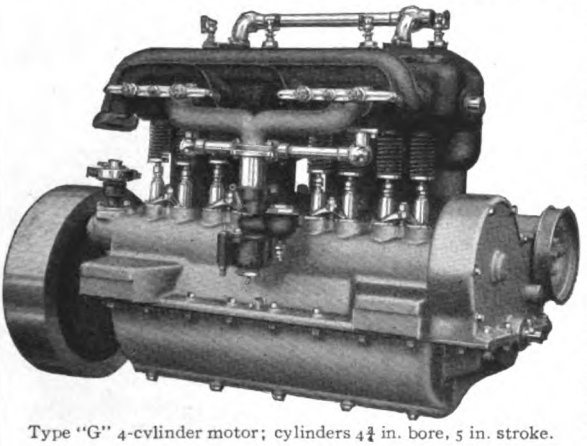

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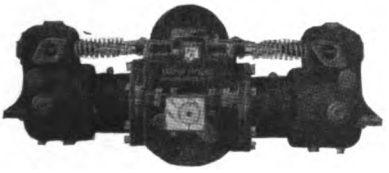
K. FRANKLIN PETERSON, Factory Representative, 166 Lake St., Chicago, Ill.



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EFFICIENT—DURABLE—COMPACT

PERFORMANCE—not words—sells Beaver Motors. Perfect running balance, positive lubricating system, ample bearings, interchangeability of parts and uniform performance.

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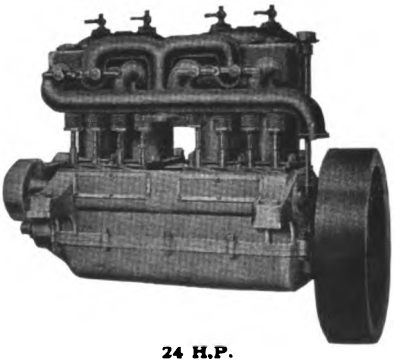

24 H.P.

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MOTORS (Gasoline, Auto.) (Continued)

NEER Air Cooled Engine Co. (The), Plain City, O.

NEWPORT Engineering Works, 359-67 Thames St., Newport, R. I.

NOANK Motor Works, Noank, Conn.

NORTH Chicago, Mach. Co. (The), North Chicago, Ill.

NORTHWAY Motor & Mfg. Co., Maybury Grand Ave., Detroit, Mich.

NUTTING Machine Co., Dayton, O.

O. K. Gas Engine Works, Winchester, O.

OSWALD Motor Co. (The), Goshen, Ind.

OTTO Gas Engine Works (The), 33d & Walnut Sts., Philadelphia, Pa.

PHILLIPS Motor Works, 405 Tacoma Bldg., Chicago, Ill.

PIERCE Engine Co., Racine Junction, Wis.

PITTSBURG Machine Co. (The), New Brighton, Pa.

REEVES Pulley Co., Columbus, Ind.

ROSS & Kramer, 5607 So. Halsted St., Chicago, Ill.

SANDUSKY Foundry & Machine Co., Sandusky, O.

SCHLOSSER Mfg. Co., 151 E. 126th St., New York.

SINTZ, Guy L., Fulton and Front Sts., Grand Rapids, Mich.

SMITH & Williams, 149 W. State St., Columbus, O.

SPEED Changing Pulley Co., Indianapolis, Ind. (see pae 49).

STERLING Engine Co., 110 Grant St., Buffalo, N. Y.

STERLING Engine Co., 29 South Clinton St., Chicago, Ill.

STREIT Machine Co., A., 1108-10 Harrison Ave., Cincinnati, O.

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

SWAIN Engine Co., 2239 State St., Chicago, Ill.

TREBERT Gas Engine Co., 163 West Main St., Rochester, N. Y.

VAN AUKEN-Clevauce Co., Yonkers, N. Y.

WARREN Mfg. Co., Warren, Mass.

WAUKESHA Motor Co., 119 North St., Waukesha, Wis.

WESTERFIELD Motor Co. (The), 1525 S. Main St., Anderson, Ind.

WESTERN Motor Co., Logansport, Ind.

WILLET Engine & Carbureter Co., 764 Ellicott Sq., Buffalo, N. Y.

XARDELL Co., C. A., Utica, N. Y.

MOTORS (Gasoline, Marine)

ALEXANDER, James, 68 W. Monroe St., Chicago, Ill.

AERO & Marine Motor Co. (The), 60 Pemberton Sq., Boston, Mass.

AUTOMATIC Machine Co. (The), Bridgeport, Conn.

AYRES Gasoline Engine Works, Saginaw, Mich.

BADECKER Gas Engine Co., Omaha, Neb.

BADGER Motor Co., Milwaukee, Wis.

BARBER Bros., 101 Grape St., Syracuse, N. Y.

BELCHER Motor Co., Fall River, Mass.

BRENNAN Motor Co., Syracuse, N. Y.

BRIDGEPORT Motor Co., Inc., Bridgeport, Conn.

BRIGGS & Wade, Lynn, Mass.

BROWN-Cochran Co. (The), Lorain, O.

BROWN-Talbot Co., Salem, Mass.

BROWNELL-Trebert Co., 408 St. Paul St., Rochester, N. Y.

BRUNO & Son, T., Saginaw, W. S., Mich.

BUDD & Ranney Mfg. Co. (The), 35-37 S. Scioto St., Columbus, O.

BUFFALO Gasoline Motor Co., 1286 Niagara St., Buffalo, N. Y.

CAILLE Bros. Co. (The), 2d Ave. and Amsterdam St., Detroit, Mich.

CAMPBELL Motor Co., Wayzata, Minn.

CARLSON, Chas. A., 1060 Bedford Ave., Brooklyn, N. Y.

CHICAGO Caloric Engine Co., 536 Wabash Ave., Chicago, Ill.

CLEMICK-Hirsch Co., 594 National Ave., Milwaukee, Wis.

CLIFTON Motor Wks., 265 E. Clifton Ave., Cincinnati, O.

COLEMAN & Sons, Walter, 300 S. Water St., Providence, R. I.

COOLEY Mfg. Co., Waterbury, Vt.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich. (see page 111).

CRAIG & Scott, 556 W. 34th St., New York.

CROSS Engine Co., M. O., 18 Atwater St. W., Detroit, Mich.

CROUCH & Co., Chas. P., 484 Carroll Ave., Chicago, Ill.

CUSHMAN Motor Co., Lincoln, Neb.

DAVIS Mfg. Co., 935 30th St., Milwaukee, Wis.

DE MOOY Bros., 765-767 Willson Ave., Cleveland, O.

DETROIT Auto Marine Co., 82 Congress St., E., Detroit, Mich.

DOMAN Co., H. C., Oshkosh, Wis.

DUCRO Mfg. Co., 1378 Niagara St., Buffalo, N. Y.

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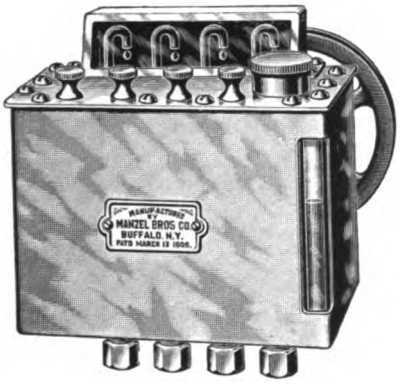
Force and Sight Feed Lubricator
for Automobiles



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Made with any number of feeds —each feed being regulated independently.

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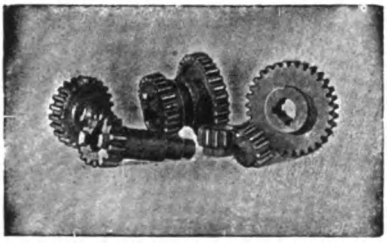

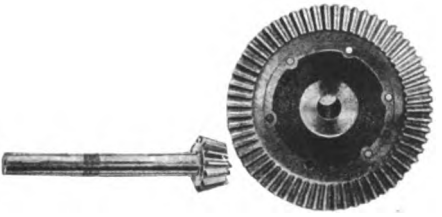

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MOTORS (Gasoline, Marine) (Continued)

DULUTH Gas Engine Works, Minnesota Ave., and Vine St., Duluth, Minn.

DUNN, Walter E., Ogdensburg, N. Y.

ECHO Company, Young & Delaware Sts., Tonawanda, N. Y.

ERD Motor Co., Saginaw, Mich.

ESSEX Engine Co. (The), 416 Union St., Lynn, Mass.

FAIRBANKS-Grant Mfg. Co., Ithaca, N. Y.

FAIRFIELD Motor Co. (The), 172 Cannon St., Bridgeport, Conn.

FAY & Bowen Mfg. Co., Geneva, N. Y.

FOX Reversible Gaso. Engine Co., Inc., Newport, Ky.

FOWLER Machine Co. (The), 1781 Middlesex St., Lowell, Mass.

FRISBIE Motor & Machine Works, Middletown, Conn.

GRAND Rapids Gas Engine & Yacht Co., Grand Rapids, Mich.

GRAY Motor Boat Co., 453 Guoin St., Detroit, Mich.

HAASE Motor Wks., 1019 Lloyd St., Milwaukee, Wis.

HARVARD Marine & Auto Co., 25 Eliot St., Cambridge, Mass.

HASBROUCK Motor Works, Inc., 155 Water St., New London, Conn.

HEINEL Co., H. A., Wilmington, Del.

HILDRETH Motor & Pump Co. (The), Waterside Ave., Lansing, Mich.

HILL, R. S., 78 E. Fort St., Detroit, Mich.

HOFFMAN Launch & Motor Works, W., 1253 N. Halsted St., Chicago, Ill.

HOLLIDAY Mfg. & Engineering Co., 160 Bunker St., Chicago, Ill.

HOLMES Motor Co. (The), West Mystic, Conn.

HOULE Motor Works, A. J., Holyoke, Mass.

HOWE Scale Co., 509 Market St., Philadelphia, Pa.

HUBBARD Motor Co., Middletown, Conn.

HURD & Haggin, 316 Hudson St., N. Y. City.

JOHNSON Motor Co. (The), Chester, Pa.

KAHLENBERG Bros., Two Rivers, Wis.

KEIDEL & Co., Henry, Baltimore, Md.

KIRKHAM Motor Mfg. Co., Bath, N. Y.

KOWALSKY Engine Co. (The), J., Verona, Pa.

LACKAWANNA Mfg. Co. (The), Newburgh, N. Y.

LAMB Boat & Engine Co., Clinton, Ia.

LOCKWOOD-Ash Motor Co., Jackson, Mich.

MASSINICK Mfg. Co., 1567 River St., Detroit, Mich.

McNAIL Brainard Engine Co., 390 Webster Ave., Long Island City, N. Y.

MIANUS Motor Works, Mianus, Conn.

MILWAUKEE Motor Co., 615 Clybourn Ave., Milwaukee, Wis

MORTAR Marine Motor Co., Third & Milton Sts., Camden, N. J.

MOTOR Car Power Equipment Co., Rear 577 Grove St., Milwaukee, Wis.

MURRAY & Tregurtha Co., 340 W. First St., So. Boston, Mass.

NEW London Motor Co., New London, Conn.

NOANK Motor Works, Noank, Conn.

NORTH Chicago Mach. Co. (The), North Chicago, Ill.

NOTTING & Son, Prospect, O.

NOYE Mfg. Co., Buffalo, N. Y.

OSWALD Motor Co. (The), Goshen, Ind.

OTTO Gas Engine Works (The), 33d and Walnut Sts., Philadelphia, Pa.

PALMER Bros., Coscob, Conn.

PALMER-Moore Co., Syracuse, N. Y.

PARKER Co., J. J., 506 Erie St., Fulton, N. Y.

PENINSULAR Motor Co., Grand Rapids, Mich.

PENNSYLVANIA Iron Works Co., 50th and Lancaster Ave., Philadelphia, Pa.

PHILLIPS Motor Works, 405 Tacoma Bldg., Chicago, Ill.

PIERCE Engine Co., Racine Junction, Wis.

PIGGINS Bros., Racine, Wis.

POTTER Mfg. Co., New Brunswick, N. J.

PROGRESSIVE Mfg. Co. (The), Torrington, Conn.

RAMSEY Mfg. Co., 472 Bullitt Bldg., Philadelphia, Pa.

RATHBUN-Lacy Co., Toledo, O.

RED Wing Boat Mfg. Co., Red Wing, Minn.

REGAL Gasoline Engine Co., Coldwater, Mich.

REX Motor Co., 69 Woodward Ave., Detroit, Mich.

RICE, Jr., & Co., John V., Bordentown, N. J.

ROCHESTER Gas Engine Co., 705 Driving Park Ave., Rochester, N. Y.

ROSS & Kramer, 5607 So. Halsted St., Chicago, Ill.

ROYAL Equipment Co., Bridgeport, Conn.

SAINT Clair Motor Co., 131 Beaubien St., Detroit, Mich.

SCHLOSSER Mfg. Co., 151 E. 126th St., New York.

SEITZ Co., F. A., 141 Frelinghuysen Ave., Newark, N. J.

SINTZ, Claude, 280 S. Front St., Grand Rapids, Mich.

SMALLEY Motor Co., Ltd., Bay City, Mich.

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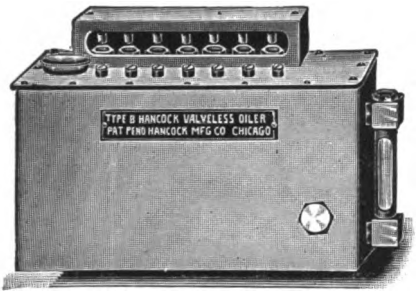

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MOTORS (Gasoline, Marine) (Continued)

SMITH & Williams, 149 W. State St., Columbus, O.

SPARKS Machine Co., C. F., Alton, Ill.

SPAULDING Engine Co., St. Joseph, Mich.

STAMFORD Motor Co. (The), Stamford, Conn.

STANDARD Motor Construction Co. (The), 172 Whiton St., Jersey City, N. J.

STERLING Engine Co., 119-121 Grant St., Buffalo, N. Y.

STERLING Engine Co., Fall River, Mass.

STREIT Machine Co. (The), A., 1108 Harrison Ave., Cincinnati, O.

STRELINGER Co., Chas. A., 96-110 Bates St., Detroit, Mich.

TEMPLE Pump Co. (The), 15th St. and 15th Pl., Chicago, Ill.

TERMAAT & Monahan Co., Oshkosh, Wis.

THOUSAND Island Boat & Engine Co., Morristown, N. Y.

TOCQUET Motor Co. (The), 4th Ave. and 24th St., N. Y. City.

TOLEDO Motor Boat & Power Co., Ft. of Washington St., Toledo, O.

TREBERT Gas Engine Co., 163 W. Main St., Rochester, N. Y.

TRIUMPH Motor Car Co., Cragin Station, Chicago, Ill.

TUTTLE, H. D., Co., Canastota, N. Y.

UNITED Mfg. Co., 175 Woodbridge St., Detroit, Mich.

VIRTUE & Pond Mfg. Co., Owatanna, Minn.

WATERMAN Marine Motor Co., Detroit, Mich.

WATKINS, Frank M., Co. (The), 525-531 Baymiller St., Cincinnati, O.

WATERMAN Marine Motor Co., Detroit, Mich.

WATERTOWN Motor Co., 40 Moulton St., Watertown, N. Y.

WESTERN Gas Engine Co., Michigan City, Ind.

WILLET Engine & Carbureter Co., 764 Ellicott Sq., Buffalo, N. Y.

WOLVERINE Motor Wks., Grand Rapids, Mich.

WRIGHT Motor Co., 48 S. Division St., Buffalo, N. Y.

MOTORS (Kerosene)

ACME Oil Engine Co., Union Ave., near R. R., Bridgeport, Conn.

BUFFALO Gasoline Motor Co., Niagara St., Buffalo, N. Y.

DIESEL Motor Co., 11 Broadway, N. Y. City.

GRAND Rapids Gas Engine & Yacht Co., Grand Rapids, Mich.

INTERNATIONAL Power Vehicle Co., 216 Pacific St., Stamford, Conn.

MIETZ, A., 138 Mott St., N. Y. City.

NEW YORK Kerosene Oil Motor Co. (The), 31 Burling Slip, New York, N. Y.

MOUNTINGS (See Trimmings, Metal)

MUD GUARDS (See Dashes and Fenders)

MUFFLERS (Exhaust)

A. & J. Mfg. Co., 26 W. Randolph St., Chicago, Ill.

A-Z Co. (The), 527 West 56th St., N. Y. City.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 133).

BYRNE, Kingston & Co., Kokomo, Ind.

CHAMPION Mfg. Co., 9-15 Alling St., Newark, N. J.

FEDERAL Automobile Co., First Nat'l Bk. Bldg., Chicago, Ill.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 151).

GRAY-Hawley Mfg. Co., 605-609 Fort St. W., Detroit, Mich.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

HAYES Mfg. Co., Detroit, Mich. (see page 43).

HAYNEY, Geo. F., Lynn, Mass.

KELLS Mfg. Co., W. J., Jersey City, N. J.

KINSEY Mfg. Co., Dayton, O.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LOOMIS Autocar Co., Westfield, Mass.

MILWAUKEE Motor Co., Milwaukee, Wis.

MORTAR Marine Motor Co., Third & Milton Sts., Camden, N. J.

MOTOR & Mfg. Works Co., Ithaca, N. Y. (see page opposite).

MOTSINGER Device Mfg. Co., 36 Main St., Pendleton, Ind.

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

POWELL Muffler & Timer Co., 42 La Fayette St., Utica, N. Y. (see page opposite).

ROSS & Kramer, 5607 So. Halsted St., Chicago, Ill.

SMITH & Co., D. B., Utica, N. Y. (see page 91).

SNOW, B. W., 132 Bissell St., Syracuse, N. Y.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WEEBER, C. F., Mfg. Works, 170-172 Central Ave., Albany, N. Y.

WESTERFIELD Motor Co., Anderson, Ind.

WESTERN Motor Co., Logansport, Ind.

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EJECTOR MUFFLER

Fig. 1

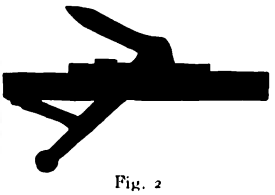

Fig. 2

THE EJECTOR, MUFFLER, CUT-OUT VALVE AND FOOT PEDAL

Fig. 1 — Cutout Valve
Fig. 2 — Foot Pedal
Fig. 3 — The Muffler

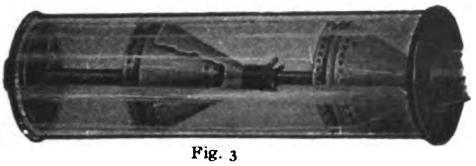

Fig. 3

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This may seem an out-of-the-ordinary combination, it is — because it is done by an *out-of-the-ordinary muffler*, but send your name and address *and we will prove it.*

Special inducements to manufacturers and live dealers to handle our muffler. Write to-day.

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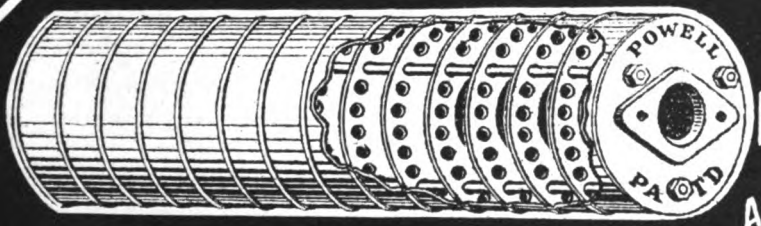

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The Most Practical Scientific Application. Quality and Workmanship Unexcelled.

This muffler is made up of a succession of pressed steel cups drawn from sheet metal of No. 16 gauge, each cup shouldered so that it overlaps the bottom of the succeeding one by ¼ of an inch. The number of cups used varying with the size of the engine to be muffled.

The end plates are of heavily ribbed gray or malleable iron, with pipe or flange connection. The perforations are around the outer edge of each baffling plate with an additional one in the center of the first few. The area of these holes varying with the size of engine to be muffled.

In ordering state size of engine cylinder and number, size of exhaust pipe and whether standard pipe, steel or flanged connection is used.

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ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (see page 51).

ALUMINUM Mfg. Co., Two Rivers, Wis.

ATWOOD Mfg. Co., Amesbury, Mass.

BALTIMORE Enamel & Novelty Co., Ft. of Allen St., Baltimore, Md.

BECKER, August, 247 Atlantic Ave., Boston, Mass.

BLACKINGTON & Co., V. H., Attleboro Falls, Mass.

BOYLE & Co., John, 112-114 Duane St., N. Y. City.

CHANDLER Co. (The), 31 Taylor St., Springfield, Mass.

CHILDS, S. D., & Co., 200 So. Clark St., Chicago, Ill.

CROWE Metal Mfg. Co., 71 W. Jackson Blvd., Chicago, Ill.

DETROIT Rubber Stamp Co., 99 Griswold St., Detroit, Mich.

EASTWOOD Wire Mfg. Co., Belleville, N. J.

ENGLISH & Mersick Co., New Haven, Conn.

FINE, Horace E., Trenton, N. J.

GREACEN & Co., Walter, 12 Mechanic St., Newark, N. J.

IMPERIAL Brass Mfg. Co., 251 So. Jefferson St., Chicago, Ill.

MEYERCORD Co. (The), Chamber of Commerce, Chicago, Ill.

MORSE, C. H., & Son, 13 So. Water St., Rochester, N. Y.

MURDOCK-Shaw Co., 125 Federal St., Boston, Mass.

MURDOCK, Jas. Jr., Co., 116 Opera Place, Cincinnati, O.

N. J. Aluminum Co., Newark, N. J.

NEW YORK Stencil Works, New York, N. Y.

QUINT, S. H., & Sons, 15 So. 4th St., Philadelphia, Pa.

REES, F. H., Steele Memorial Bldg., Elmira, N. Y.

ROBBINS Mfg. Co., John, 58 Kneeland St. Boston, Mass.

ROGERS, C. E., 34 Beach St., Boston, Mass

SMITH, R. H., Mfg. Co. (The), Springfield, Mass. (see page 153).

SMITH & Co., Jos. N., 154-162 4th St. Detroit, Mich. (see page 175).

SPENCER'S Sons, I. S., Guilford, Conn.

STAFFORD Co., N., 67 Fulton St, New York.

SYRACUSE Aluminum & Bronze Co. 530 Leavenworth Ave., Syracuse, N. Y (see pages 27 and 53).

TORREY Roller Bushing Works, Bath, Me.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

U. S. Bronze Co. (The), Cleveland, O.

WADSWORTH Engraving Co., 21 W. Washington St., Springfield, O.

WALTER, N. C., & Sons, 194 William St. N. Y. City.

NIPPLES

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

HARTFORD Machine & Screw Co., 476 Capitol Ave., Hartford, Conn.

JAMESVILLE Mfg. Co., Jamesville, N. Y.

JUDD & Leland Mfg. Co., Clifton Springs. N. Y.

PARK City Brass Co., Springfield, Mass.

PARKER, E. N., Springfield, Mass.

SHRIMPTON Mfg. Co., Church St., N. Y City.

STANDARD Co. (The), Torrington, Conn.

STEVENS & Co., 99 Chambers St., New York, N. Y.

TILEY-Pratt Co. (The), Essex, Conn.

TOLEDO Metal Wheel Co., Toledo, O.

YOUSE, E. S., Reading, Pa.

NUTS AND WASHERS (Lock)

ALLISON Mfg. Co., Philadelphia, Pa.

AMERICAN Iron & Steel Mfg. Co., Lebanon. Pa.

COLUMBIA Nut & Bolt Co., Bridgeport. Conn.

EUREKA Nut Lock Co., Pittsburg, Pa.

GRIP Nut Co., South Whitley, Ind.

MICHIGAN Bolt & Nut Co., Detroit, Mich.

NATIONAL Elastic Nut Co., Milwaukee Wis.

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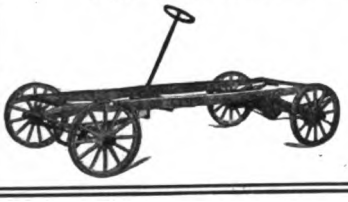

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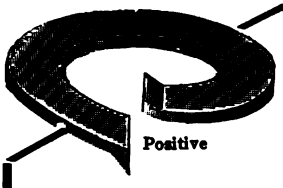
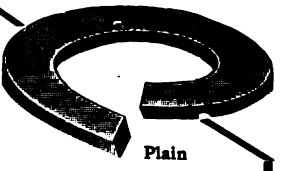


Positive

The POSITIVE Lock Washer



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POSITIVE LOCK WASHER CO., Newark, N. J.

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NATIONAL Lock Washer Co., 65-89 Johnson St., Newark, N. J. (see page 119).

POSITIVE Lock Washer Co., Newark, N. J. (see page 119).

SPIRAL Nut Lock Co., New York, N. Y.

ODOMETERS (See Indicators—Speed and Distance)

OILS

ALEXANDER & Co., H. T., 17 State St., N. Y. City.

AMERICAN Cement & Oil Co., 44 W. Quincy St., Chicago, Ill.

AMERICAN Oil Co., 170-178 S. Water St., Jackson, Mich.

ANNIS Oil Co., N. L., 139 Potomac St., Buffalo, N. Y.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers an dJobbers) (see page 63).

AUTO Oil Co., Jackson, Mich.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BESLY & Co., C. H., Chicago, Ill.

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BORNE-Scrymser Co., Claremont, N. J.

CHAMPION Oil Co., 39th St. and Lowe Ave., Chicago, Ill.

CHESTERTON & Co., A. W., 64 India St., Boston, Mass.

CHILDS Co., G. B. (The), 499 Greenwich St., N. Y. City.

CLARK, E. W., & Co., 89 New Chambers St., N. Y. City.

COLUMBIA Lubricants Co. of New York, 78 Broad St., N. Y. City (see page opposite).

CURRY Oil & Supply Co., Boston, Mass.

DEARBORN Drug & Chemical Works, Chicago, Ill.

DIXON, Jos., Crucible Co., Wayne and Monmouth Sts., Jersey City, N. J.

DRAPER Co., Walter H., 120 South Railroad Ave., Mount Vernon, N. Y.

ECONOMY Oil & Compound Co., 442 Clark St., Chicago, Ill.

EMERY Mfg. Co., Radford, Pa.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

Fiske Bros. Refining Co., 13-15 Old Slip, N .Y. City (see page 85).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

GALENA Signal Oil Co., Franklin, Pa.

GALLAWAY, G. W., 322 Pearl St., New York.

HARRINGTON Lubricant Co., 1691 Broadway, New York.

HARRIS, A. W., Oil Co., 330 Water St., Providence, R. I. (see back cover).

HAVEMEYER Oil Co., 78 Broad St., N. Y. City.

HAWS, George A., 74 Pine St., N. Y. City (see page 224).

HOFFMAN Lubricating Oil Co., Binghamton, N. Y.

KANTER Co., R. J., 647 Water St., N. Y. City.

KELLOGG, E. H., Co., 243-244 South St., N. Y. City.

KELLOM & Co., Chas. F., 128 Arch St., Philadelphia, Pa.

MACLEAN Oil & Supply Co., 463 Atlantic Ave., Boston, Mass.

MAGIE Bros., 9-11 No. Canal St., Chicago, Ill.

MARION Mfg. Co., Franklin, Pa.

MILLER'S Sons, Wm. P., 73-79 Third St., Long Island City, N. Y. (see page 85).

MODOC Co. (The), Foot of Market St., Chester, Pa.

MONARCH Mfg. Co., Toledo, O.

MOTOR Car Supply Co. (The) 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MOUND CITY Oil & Supply Co., 203-205 North Levee, St. Louis, Mo.

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

MUSLINER & Co., Jos., 156 Maiden Lane, N. Y. City.

NATIONAL Cement & Rubber Mfg. Co., 3053-59 Monroe St., Toledo, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

N. Y. & N. J. Lubricant Co., 15 Church St., N. Y. City.

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

NORTHROP Lubricating Oil Co., 308 N. Commercial St., St. Louis, Mo.

NYE, Wm. F., New Bedford, Mass.

OIL City Oil & Grease Co., Oil City, Pa.

O-U-T-O Co. (The), 19 Camfield St., Newark, N. J.

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PARAGON Refining Co. (The), Toledo, O.

PENN Oil & Supply Co., Chicago, Ill.

PENN Petroleum Co., 117 N. 2d St., Philadelphia, Pa. (see page 25).

PHILADELPHIA Grease Mfg. Co., Philadelphia, Pa.

PIGOT, Sayre & Co., 135 William St., N. Y. City.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

PULVER & Sons, Peter, N. Y. City.

RELIANCE Oil & Grease Co., 12 S. Water St., Cleveland, O.

RICHARDSON Lubricating Co., Quincy, Ill.

ROBINSON, Son & Co., Wm. C., Baltimore, Md.

ROYAL Lub. Oil Co., 116 Broad St., N. Y. City.

ROYAL Oil Co., 2 Platt St., N. Y. City.

SHEPPARD, W. S., 22 Lawrence St., Newark, N. J. (see page opposite).

SPEAR'S Sons Co., The Alden, 369 Atlantic Ave., Boston, Mass.

STANDARD Oil Co., 26 Broadway, N. Y. City.

STAR Lubricating Co., N. Y. City.

STERLING Oil Co., Emlenton, Pa.

SWAN & Finch Co., 151 Maiden Lane, New York.

SWEET, Charles F., 61 Market St., Hartford, Conn.

UNDERHAY Oil Co., 275 Franklin St., Boston, Mass.

VACUUM Oil Co., Rochester, N. Y.

VALVOLINE Oil Co., N. Y. City.

VISCOSITY Oil Co., 21 River St., Chicago, Ill.

WADHAMS Oil Co., Milwaukee, Wis.

WHITE & Bagley Co. (The), 100 Foster St., Worcester, Mass.

WINN, F. R., Co., 147 Maiden Lane, N. Y. City.

YOUNG, Orlando W., 180 Freylinghuysen Ave., Newark, N. J. (see page 211).

OILS (Semi-Solid)

COLUMBIA Lubricants Co. of New York, 78 Broad St., N. Y. City (see page 121).

HARRIS Oil Co., A. W., 330 So. Water St., Providence, R. I. (see back cover).

HAWS, Geo. A., 74 Pine St., N. Y. City (see page 224).

MILLER'S Sons, Wm. P., 73-79 Third St., Long Island City, N. Y. (see page 85).

MUSLINER & Co., Jos., 156 Maiden Lane, N. Y. City.

N. Y. & N. J. Lubricant Co., 14 Church St., New York.

SHEPPARD, W. S., 22 Lawrence St., Newark, N. J. (see page opposite).

OIL CANS

AKRON Mfg. Co., 927 S. High St., Akron, O.

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co. (The), 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BROWN Oil Can Co., Toledo, O.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

GEM Mfg. Co., Spruce near 33d St., Pittsburg, Pa.

HAUCK-Seebach Co., 291-295 Essex St., Brooklyn, N. Y.

MANUFACTURERS' Can Co., Mulberry and South Sts., Newark, N. J.

MAPLE City Mfg. Co., Monmouth, Ill.

MOSHER Sales Co., 32 St. Paul St., Richester, N. Y. (see page opposite).

MOTOR Car Supply Co. (The), 1425-1427 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW YORK Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

NOERA Mfg. Co., Waterbury, Conn.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

SCOVILL Mfg. Co., Waterbury, Conn.

WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill. (see page 159).

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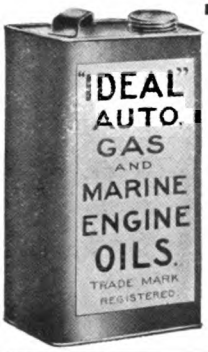

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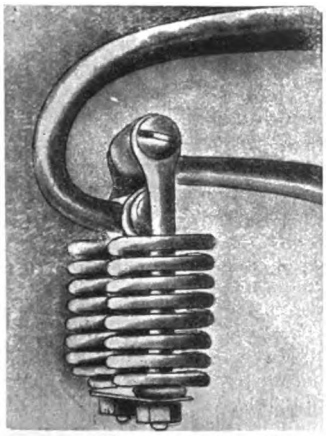

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OIL CUPS

AURORA Automatic Mach. Co., Aurora, Ill.

BAY State Stamping Co., 380 Chandler St., Worcester, Mass.

BOWEN Mfg. Co., Auburn, N. Y.

DETROIT Lubricator Co., Lincoln Ave. and G. T. R. R., Detroit, Mich.

ERIE Stamping & Mfg. Co., Erie, Pa.

ESSEX, G. B., Brass Co., 480 Franklin St., Detroit, Mich.

LAVIGNE Mfg. Co., Detroit, Mich.

LUNKENHEIMER Co. (The), Cincinnati, O.

SHERWOOD Mfg. Co., Buffalo, N. Y.

SPENCE Mfg. Co., 279 Park St., Milwaukee, Wis.

STAR Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

TUCKER, C. F., Hartford, Conn.

WILLIAMS Valve Co. (The), D. T., 904-910 Broadway, Cincinnati, O

WINKLEY Co. (The), Detroit, Mich.

McRAE & Roberts Co., 227-235 Campbell Ave., Detroit, Mich.

MOSHER Sales Co., 32 St. Paul St., Rochester, N. Y. (see page 123).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

N. Y. & N. J. Lubricants Co., 15 Church St., N. Y. City.

NOERA Mfg. Co., Waterbury, Conn.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

RANDALL-Faichney Co., Boston, Mass. (see page 123).

STEVENS & Co., 99 Chambers St., New York.

OIL GUNS

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

COLUMBIA Lubricants Co. of New York, 78 Broad St., N. Y. City (see page 121).

ELKHART Brass Mfg. Co., Prospect St., Elkhart, Ind.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-AMERICAN Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

GLEASON-Peters Air Pump Co., 20 West Houston St., New York.

HAUCK-Seebach Co., 291-295 Essex St., Brooklyn, N. Y.

MANHATTAN Screw Lamp Co., 7th Ave. and 11th St., N. Y. City.

OIL-HOLE COVERS

BAY State Stamping Co., 380 Chandler St., Worcester, Mass.

BOWN Machine Works, Battle Creek, Mich.

TUCKER, C. F., 302 Asylum St., Hartford, Conn.

WINKLEY Co. (The), Detroit, Mich.

OIL PUMPS

DETROIT Lubricator Co., Lincoln Ave. and R. R., Detroit, Mich.

EASTERN Oil Tank Co., 136 Fletcher St., Lowell, Mass. (see page opposite).

ESSEX Brass Co., G. B., 480 Franklin St., Detroit, Mich.

HAUCK-Seebach Co., 291-295 Essex St., Brooklyn, N. Y.

IMPERIAL BRASS Mfg. Co., 251 So. Jefferson St., Chicago, Ill.

LAVIGNE Mfg. Co., Detroit, Mich.

MADISON-Kipp Mfg. Co., Madison, Wis.

MANZEL Bros. Co., 313 Babcock St., Buffalo, N. Y. (see page 113).

M'CORD & Co., Old Colony Bldg, Chicago, Ill. (see page 101).

NATIONAL Oil Pump & Tank Co. (The), Dayton, O. (see page 157).

NOERA Mfg. Co., Waterbury, Conn.

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LONG DISTANCE—SELF MEASURING.
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You are paying from five to seven cents more for each gallon of gasolene you buy than you should unless you use

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"The Eastern" is especially adapted for retail purposes or for private garage. This outfit pumps a quart or two quarts at one stroke of the lever. It has Anti-Drip Nozzle, Shut-off Cocks and Stuffing Boxes, making evaporation impossible and keeps your gasolene always fresh.

By far the best and cheapest outfit on the market. Its advantages are manifold. Write for details.

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SIGHT Feed Oil Pump Co., 1148 Holton St., Milwaukee, Wis.

STAR Brass Mfg. Co., 108-114 E. Dedham St., Boston, Mass.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WILLIAMS Valve Co. (The), D. T., 904-910 Broadway, Cincinnati, O.

PACKING

AMERICAN Steam Packing Co., Boston, Mass.

Booth, N. E., 743-45 39th St., Brooklyn, N. Y. (see page opposite).

BOSTON Woven Hose & Rubber Co., 29 Hampshire St., Cambridge, Mass.

CHESTERTON & Co., A. W., 64 India St., Boston, Mass.

CHICAGO Rawhide Mfg. Co., 75-77 Ohio St., Chicago, Ill.

EAGLE Oil & Supply Co., 104 No. Broad St., Boston, Mass.

GOULD Packing Co., 88 E. Cambridge St., E. Cambridge, Mass.

GREENE, Tweed & Co., 17 Murray St., N. Y. City.

JOHNS-Manville, H. W., Co., 100 William St., N. Y. City.

KEASBEY, Robert A., 83 Warren St., N. Y. City.

KEASBY-Mattison Co., Ambler, Pa.

N. J. Asbestos Co., Camden, N. J.

N. J. Car Spring & Rubber Co., Wayne and Brunswick Sts., Jersey City, N. J.

SMOOTH-ON Mfg. Co., 572-574 Communipaw Ave., Jersey City, N. J.

PAINTS

ACME White Lead & Color Works, Detroit, Mich.

BERRY Bros., Ltd., Detroit, Mich.

BILLINGS-Chapin Co. (The), Cleveland, O.

BUFFALO Enamel & Stain Co., Buffalo, N. Y.

DETROIT White Lead Wks., 532 Milwaukee St., Detroit, Mich.

DITZLER Paint & Color Works, 14 Baltimore Ave., West Detroit, Mich.

FELTON, Sibley & Co., 136-140 No. 4th St., Philadelphia, Pa.

GRAVES & Congdon Co., Oak St., Amesbury, Mass.

MASURY & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

PATTERSON-Sargent Paint Co., Cleveland, Ohio.

SCHRACK, C., & Co., 152 No. 4th St., Philadelphia, Pa.

SHERWIN-Williams Paint Co., 100 Canal St., Cleveland, O.

STANDARD Varnish Works, 29 Broadway, N. Y. City (see page 179).

VALENTINE & Co., 257 Broadway, N. Y. City.

PANELS (Wood)

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J. (see page 15).

BOTHNER Hardwood Moulding Co., 1945 Park Ave., N. Y. City.

DANN Bros. Co. (The), 80 Franklin St., New Haven, Conn.

OHIO Scroll & Lumber Co., Covington, Ky.

PANS (Drip)

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 45).

BURROWS Co., E. T., Portland, Me.

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

HAYES Mfg Co., 360-70 Maybury Ave., Detroit, Mich. (see page 43).

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

PATTERN MAKERS

BALKWILL Pattern Works, 970 Hamilton St., Cleveland, O.

GARDAM & Son, Wm., 45 Rose St., N. Y. City.

HARTFORD Pattern & Model Co., Inc. (The), 14 Hicks St., Hartford, Conn.

HOPSON-Chapin Mfg. Co., New London, Conn.

MANUFACTURERS Fdry. Co., Waterbury, Conn.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 101).

MEISEL Press & Mfg. Co., 944-948 Dorchester Ave., Boston, Mass.

MODEL Pattern Works, Washington and Perry Sts., Buffalo, N. Y.

OLMSTEAD, H. B. Co., 663 Manhattan Ave., Brooklyn, N. Y.

PARSELL & Weed, 129-131 W. 31st St., N. Y. City.

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CRANE Co., Chicago, Ill.

HARRISBURG Pipe & Pipe Bending Co., Harrisburg, Pa.

LA BELLE Iron Works, Steubenville, O.

MARK Mfg. Co., Evanston, Ill.

NATIONAL Tube Co., New York, N. Y.

READING Iron Co., Reading, Pa.

SHELBY Steel Tube Co., Pittsburg, Pa.

SOUTH CHESTER Tube Co., Chester, Pa.

SPANG, Chalfant & Co., Pittsburg, Pa.

UNITED STATES Tube & Iron Co., Pittsburg, Pa.

WESTERN Tube Co., Kewanee, Ill.

YOUNGSTOWN Iron, Steel & Tube Co., Youngstown, O.

PIPE COILS

BLISS-Chester Co., Providence, R. I.

NATIONAL Pipe Bending Co., New Haven, Conn.

STANDARD Metalwork Co., Thompsonville, Conn.

WHITLOCK Coil Pipe Co. (The), Hartford, Conn. (see page 89).

PIPE FITTINGS
See Fittings (Pipe)

PISTON RINGS

HAGUE & Co., 6123 Penn Ave., E. Pittsburg, Pa.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

JORDEN, R. H., 110 Sheridan St., Allegheny, Pa.

PLATINUM

AMERICAN Platinum Works, 251 N. J. R. R. Ave., Newark, N. J.

BAKER & Co., Inc., 408-414 N. J. R. R. Ave., Newark, N. J.

CROSELMIRE & Ackor Co., 42 Walnut St., Newark, N. J.

GOLDSMITH Bros., Chicago, Ill.

PLATING (Brass and Nickel)

BRIDGEPORT Electro Plating Co., Bridgeport, Conn.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (see page 151).

HILLMAN Plating Co., 446 Tremont St., Boston, Mass.

IDEAL Plating Co., 3 Appleton St., Boston, Mass.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 175).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

PLIERS AND NIPPERS (See Tools)

POLISHES (Body and Metal)

ADAMS & Elting Co., 155 W. Washington St., Chicago, Ill.

ALLERS & Co., Harry A., 136 Liberty St., New York.

AMER. Metal Polish Co., 89 Winslow Ave., W. Somerville, Mass.

AUTO Oil Co., Jackson, Mich.

AUTOMOBILE Specialty Co., 509 Willoughby Bldg., Chicago, Ill. (see page 157).

BADGER Chemical Mfg. Co., 143 Reede St., Milwaukee, Wis.

BELL Mfg. Co. (The), 113 Morgan St., St. Louis, Mo.

BOTT Bros. Mfg. Co. (The), 166 N. High St., Columbus, O.

BUFFALO Enamel & Stain Co., 481 Ellicott Sq., Buffalo, N. Y.

BUFFALO Specialty Co., 3751-77 Ellicott St., Buffalo, N. Y.

CHILDS Co., The G. B., 499 Greenwich St., New York.

CLEANER Mfg. Co., 2842-44 Olive St., St. Louis, Mo.

CROSS, W. H., 18 Franklin St., Brooklyn, N. Y.

EAGLE Mfg. Co., 383 Prospect St., Cleveland, Ohio.

EAGLE Oil & Supply Co., 52 Broad St., Boston, Mass.

FAIRCHILD & Bro., M. H., 119 Michigan St., Chicago, Ill.

GRAMLICH Chemical Co., 167 Leverett St., Detroit, Mich.

HARRIS, A. W., Oil Co., 330 S. Water St., Providence, R. I. (see back cover).

HASSLER Co., Owen C., 565 W. Fullerton Ave., Chicago, Ill.

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"GLOBE" METAL POLISH

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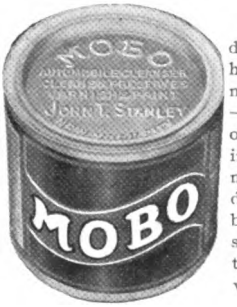

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LEADER Mfg. Co., 1808 Chestnut St., St. Louis, Mo.

LEAVITT, Gilbert, 11 India St., Boston, Mass.

LORD Polish Co., F. T., Cambridge, Mass.

LUSTRE Chemical Co., 1303 Michigan Ave., Chicago, Ill.

MAGIE Bros., 9-11 N. Canal St., Chicago, Ill.

MARSHALL Chemical Co., 80 William St., New York.

MEXICAN Mfg. Co. (The), 239 S. Main St., Wichita, Kan.

MODOC Co, (The), Foot of Market St., Chester, Pa.

MONARCH Mfg. Co., Toledo, O.

NATIONAL Cement & Rubber Mfg. Co., 3055 Monroe St., Toledo, O.

NEWBERN Co., S. C., 430 Walnut St., Philadelphia, Pa.

ORIENT Mfg. Co., 141 Milk St., Boston, Mass.

PAUL, J. C., & Co., 59 Dearborn St., Chicago, Ill.

PURITAN Soap Co., 502 Exchange St., Rochester, N. Y.

RAIMES & Co., 50 Ferry St., N. Y. City. (see page 129).

RATH Mfg. Co., Hancock, Laurel and Second Sts., Philadelphia, Pa.

ROYAL Polish Co., 301-303 W. 63d St., Chicago, Ill. (see page 129).

SHEPPARD, W. S., 22 Lawrence St., Newark, N. J. (see page 123).

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 175).

SPEAR'S Sons Co., Alden (The), 369 Atlantic Ave., Boston, Mass.

VELOX Chemical Co., Dexter Bldg., Chicago, Ill.

PORCELAIN (Insulators)

AMERICAN Lava Co., Chattanooga, Tenn.

BISHOP Gutta-Percha Co., 425 E. 25th St., New York City.

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IMPERIAL Porcelain Works (The), Trenton, N. J.

NATIONAL Porcelain Co., Trenton, N. J.

PASS & Seymour, Syracuse, N. Y.

STANDARD China Works, Trenton, N. J.

STAR Porcelain Co., Trenton, N. J.

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CRISPIN Sheet Metal Mfg. Co., 3038-3046 Chestnut St., Philadelphia, Pa.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

HYDRAULIC Pressed Steel Co., Cleveland, O. (see inside back cover).

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

KEIM Mills (Inc.), John A., Liberty and Kensington Ave., Buffalo, N. Y.

KINSEY Mfg. Co., Dayton, O.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

METAL Specialties Mfg. Co., 18-24 W. Randolph St., Chicago, Ill.

MOSSBERG Co., Frank, Attleboro, Mass.

PARISH & Bingham Co., Cleveland, O. (see page 77).

SMITH Co., A. O., Milwaukee, Wis.

WORCESTER Pressed Steel Co., Worcester, Mass.

PUMPS (Fuel, Air)

AMERICAN Steam Pump Co., Battle Creek, Mich.

BOSTON Auto Exchange, 177 Berkeley St., Boston, Mass.

BRIDGEPORT Brass Co., Bridgeport, Conn.

CLEVELAND Faucet Co., (The), Cleveland, Ohio.

LEATHER and Brass Mfg. Co., Auburn, N. Y.

REASON Automatic Air Pump Co., Pontiac, Mich.

RUMSEY & Co., Seneca Falls, N. Y.

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OFELDT & Sons, F. W., Nyack-on-the-Hudson, N. Y.

UNION Steam Pump Co., Battle Creek, Mich.

PUMPS (Circulating)

AMER. Mach. & Mfg. Co., Cleveland, O.

AUTO & Power Appliance Co. (The), Cleveland, O. (see page 21).

BRENNAN Motor Co., Syracuse, N. Y.

BROWN & Sharpe Mfg. Co., Providence, R. I.

BYRNE, Kingston & Co., Kokomo, Ind.

ESSEX Brass Co., G. B., Detroit, Mich.

GARVIN Machine Co., Spring & Varick Sts., N. Y. City.

IMPERIAL Brass Mfg. Co., 257 So. Jefferson St., Chicago, Ill.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LIPMAN Mfg. Co., Beloit, Wis.

LOBEE Pump & Machinery Co., 140-152 Terrace, Buffalo, N. Y.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 101).

MILWAUKEE Motor Co., Milwaukee, Wis.

N. Y. Gear Wks., Brooklyn, N. Y.

OBERDORFER Brass Co., M. L., Syracuse, N. Y.

PELTON Gas. Eng. Wks., Lyons, La.

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill. (see page 109).

ROSS & Kramer, 5607 So. Halsted St., Chicago, Ill.

SPENCE Mfg. Co., 279 Park St., Milwaukee, Wis.

PUMPS, OIL (See Oil Pumps)

PUMPS, TIRE

See Tire Inflators (Power Driven),

Tire Inflators (Pump),

Tire Inflators (Tank)

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JUDD & Leland Mfg. Co., Clifton Springs, N. Y.

KELLOGG, G. W., 9 Belmont St., Rochester, N. Y.

PARK City Brass Co., Springfield, Mass.

PARKER, E. N., 293 Main St., Springfield, Mass.

SCHRAEDER Sons, A., N. Y. City.

STEVENS & Co., 99 Chambers St., N. Y. City.

YOUSE, E. S., 46 N. 5th St., Reading, Pa.

RADIATORS

A-Z Co. (The), 527 W. 56th St., N. Y. City.

BLISS Chester Co., 31 Mathewson St., Providence, R. I.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page opposite).

DETROIT Auto Specialty Co., Detroit, Mich. (see page 89).

DIAMOND Stamped Ware Co., Detroit, Mich.

DUPLEX Automobile Radiator Co., 103 Meldrum Ave., Detroit, Mich.

FEDDERS Mfg. Works, Buffalo, N. Y. (see page opposite).

HAYES Mfg. Co., 360-70 Maybury Ave., Detroit, Mich. (see page 43).

HEWITT Motor Co., 10 E. 31st St., N. Y. City.

KELLS, W. J., Mfg. Co., Jersey City, N. J.

KINSEY Mfg. Co., Dayton, O.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

LONG-Turney Mfg. Co., Rome, N. Y.

MAYO Radiator Co., New Haven, Conn. (see page 89).

METAL Stamping Co., 243 West St., N. Y. City.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 41).

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

PURSELL Mfg. Co., P. M., 802 Beecher St., Indianapolis, Ind. (see page 89).

STANDARD Metalwork Co., Thompsonville, Conn.

WHITLOCK Coil Pipe Co. (The), Hartford, Conn. (see page 89).

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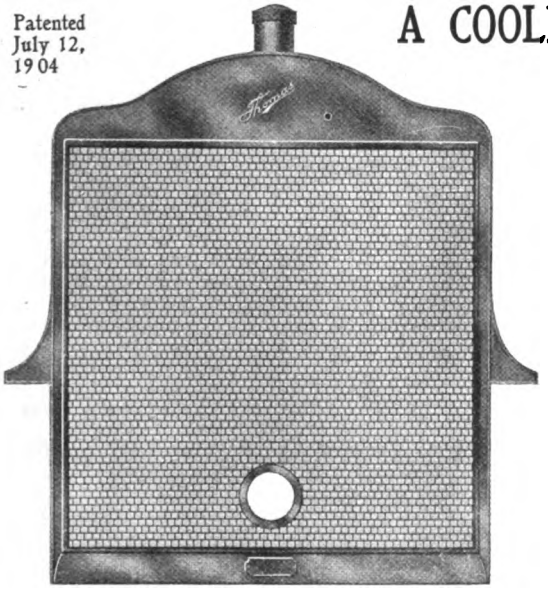

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BRYANT Steel Wheel & Rim Co., 454 Hayden Bank Bldg., Columbus, O.

CONTINENTAL Caoutchouc Co. (The), 43 Warren St., N. Y. City (Importers) (see page 171).

JAMESVILLE Mfg. Co., Jamesville, N. Y.

MIDGLEY Mfg. Co., Columbus, O.

STANDARD Welding Co. (The), Cleveland, O.

WESTON-Mott Co., Flint, Mich.

RIMS (Wood)

HAGERSTOWN Spoke & Bending Co., Hagerstown, Ind.

JONES & Co., Phineas, Newark, N. J. (see page 119).

RASTETTER, Louis, & Son, Ft. Wayne, Ind.

TUCKER Woodwork Co. (The), Sidney, O.

ROBES (Auto)

AMER. Buffalo Robe Co., Buffalo, N. Y.

CHASE Co., L. C., Boston, Mass. (see page 173).

CHICAGO Auto Robe Supply Co., 155-159 Market St., Chicago, Ill.

DAVIS Robe Co., Inc., 1307 Champlain Bldg., Chicago, Ill.

DUSENBURY, Louis, 86-88 Worth St., New York.

DRAPER Bros., Canton, Mass.

GAUSLER & Starr, Philadelphia, Pa.

MORAWETZ Co. (The), Milwaukee, Wis.

PARSONS Buggy Top Co., Chicago, Ill.

PIONEER Woolen Mills, Beaufait St. and Gratiot Ave., Detroit, Mich.

RILEY, Wm. B. & Son, 324-326 Market St., Philadelphia, Pa.

WESTERN Robe Co., Detroit, Mich.

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AUTO Robe Rail Co., Fourth National Bank Bldg., Grand Rapids, Mich.

BARLOW Mfg. Co., Holyoke, Mass.

HARPER Co., Walter J., 229-231 Mulberry St., Newark, N. J.

HILLMAN Plating Co., 446 Tremont St., Boston, Mass.

HUME Carriage Co., Amesbury, Mass. (see page 39).

MASON, John A., Newton, Mass.

RANDS Mfg. Co., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 Fourth St., Detroit, Mich. (see page 175).

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CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

HOLMES, Booth & Hayden Co. (The), Waterbury, Conn.

RANDOLPH-Clowes Co., Waterbury, Conn.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

RODS (Distance)

GARFORD Co. (The), Elyria, O.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

RUBBER CLOTH

CARR, F. S., 74 Pearl St., Boston, Mass. (see page 175).

CHASE Co., L. C., Boston, Mass. (see page 173).

EMPIRE Rubber Mfg. Co., Trenton, N. J.

HARTFORD Rubber Works Co., Hartford, Conn. (see page 161).

LANDERS Bros. Co., Toledo, O.

MANUFACTURERS' Selling Co. (The), 1777 Broadway, N. Y. City.

MUTTY, L. J., 28 Summer St., Boston, Mass. (see page 173).

WESTERN Rubber Co., Goshen, Ind.

RUNNING GEARS

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 119).

GARFORD Co. (The), Elyria, O.

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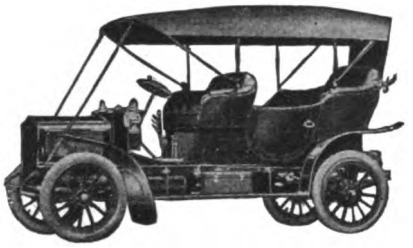

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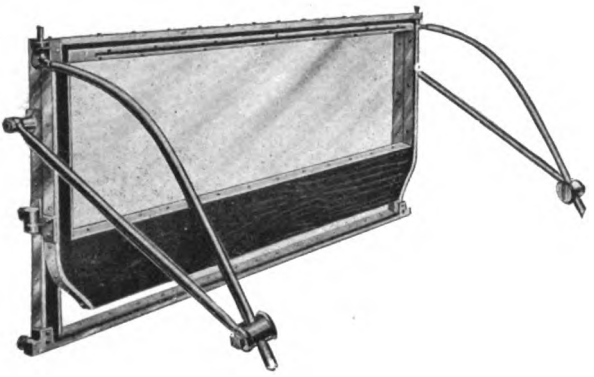

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SMITH Co., A. O., Milwaukee, Wis.

WALKER & Co., E. C. 1913 Logan St., Louisville, Ky.

SCREWS

ATLAS Bolt & Screw Co., Cleveland, O.

BLAKE & Johnson, 125 E. Main St., Waterbury, Conn.

CLEVELAND Cap Screw Co., 2216 Clarkwood Rd., Cleveland, O.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 43).

DETROIT Screw Works, Detroit, Mich.

HARTFORD Machine Screw Co., 476 Capitol Ave., Hartford, Conn.

KIRK-Latty Co., Cleveland, O.

MANHATTAN Screw & Lamp Co., 7th Ave. and 11th St., N. Y. City.

NATIONAL Screw & Tack Co., Cleveland, O.

PENINSULAR Milled Screw Co., Detroit, Mich.

PROGRESSIVE Mfg. Co., Torrington, Conn.

UPSON Bolt & Nut Co., Cleveland, O.

WATERBURY Mfg. Co., Waterbury, Conn.

WESTERN Automatic Machine Screw Co. (The), Elyria, O.

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DETROIT Screw Works, Detroit, Mich.

DOVER Co., Geo. W., 80 Clifford St., Providence, R. I.

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HARTFORD Mach. Screw Co., Hartford Conn.

HATCHER Auto Parts Co. (The), 140 Viaduct, Cleveland, O. (see page 5).

HOLT & Co., Wm. H., 95 Pine St., Providence, R. I.

ILLINOIS Screw Co., Chicago, Ill.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 101).

MACHINERY Forging Co., Hamilton and Marquette Sts., Cleveland, O.

MACK Mfg. Co., Thos. A., 401-417 St. Paul Ave., Jersey City, N. J.

MOSSBERG Co., Frank, Attleboro, Mass.

METAL Specialties Mfg. Co., 14-24 W. Randolph St., Chicago, Ill.

NATIONAL Cycle Mfg. Co., Bay City, Mich.

NILES-Bement-Pond Co., 111 Broadway, N. Y. City.

PENINSULAR Milled Screw Co., Detroit, Mich.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WESTERN Instrument Co., 18-20 W. Randolph St., Chicago, Ill.

WORCESTER Mach. Screw Co., Worcester, Mass.

SEATS (Auto)

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J. (see page 15).

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 43).

DANN Bros. Co. (The), 80-88 Franklin St., New Haven, Conn.

DAYTON Folding Tonneau Co., Dayton, O.

EMPIRE Gear & Top Co., 53 Mechanic St., Newark, N. J.

FELLWOCK Automobile & Mfg. Co. (The), Evansville, Ind.

FRANTZ Body Mfg. Co. (The), Akron, O.

HALLIDAY, C. A., 42 Cedar St., Oneida, N. Y.

HUME Carriage Co., Amesbury, Mass. (see page 39).

ITHACA Carriage Co., Ithaca, N. Y.

MILLER & Co., A. J., Bellefontaine, O.

RATTAN Mfg. Co., New Haven, Conn.

WHIPPLE, R. W., Binghamton, N. Y.

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COATES Clipper Mfg. Co., Worcester, Mass. (see page 47).

GEM Mfg. Co., Spruce near 33d St., Pittsburg, Pa.

STOW Flexible Shaft Co., Philadelphia, Pa.

WHITE Dental Mfg. Co., Philadelphia, Pa.

SHELLS (Boiler, Copper)

HUNGERFORD Brass & Copper Co., New York, N. Y.

RANDOLPH-Clowes Co., Waterbury, Conn.

SHELLS (Boiler, Steel)

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 45).

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

PRESSED Steel Tank Co., Milawukee, Wis.

STANDARD Welding Co. (The), Cleveland, O.

SHOCK ABSORBERS

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (see page 177).

DIEZEMANN Shock Absorber Co., 1311 Hudson St., Hoboken, N. J.

GABRIEL Horn Mfg. Co., 934 Hamilton Ave., N. E., Cleveland, O.

GOULD-Derby Mfg. Co., 109 N. Broad St., Trenton, N. J.

GRAHAM & Goodman, 51-55 W. 93d St., N. Y. City.

HARTFORD Suspension Co., 67 Vestry St., N. Y. City (see page 205).

HERCULES Auto Specialty Mfg. Co., Los Angeles, Cal.

HOTCHKIN Mfg. Co. (The), 1262 Michigan Blvd., Chicago, Ill.

INDIANAPOLIS Bolster Spring Co., 326 W. Georgia St., Indinaapolis, Ind.

KILGORE Mfg. Co., Old Town, Me.

MOTOR Supplementary Springs Co., Inc., 106 Fulton St., N. Y. City.

OIL Tempering Spring Co., Chicopee Falls, Mass.

RUCKERT Compound Shock Absorber, 66 Leonard St., N. Y. City.

SAGER Co., J. H., Rochester, N. Y.

SUPPLEMENTARY Spiral Spring Co., 4528-4530 Delmar Ave., St. Louis, Mo. (see page 123).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

VESTAL Shock Absorber Co., Baum and Whitfield Sts., E. E., Pittsburg, Pa. (see page opposite).

VICTOR Shock-Absorber Co., 1937 Broadway, N. Y. City (see page 137).

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

WEEBER Mfg. Wks., C. F., 170-172 Central Ave., Albany. N. Y.

WERNER Car Imp. Co., 110 W. 34th St., N. Y. City.

WILLYOUNG Appliance Co., Ludlow Sta., Yonkers, N. Y.

SOAPS (Special for Automobilists)

AMERICAN Oil Co., 170-178 So. Water St., Jackson, Mich.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTO Oil Co., Jackson, Mich.

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BADGER Chemical Mfg. Co., Lake and Reed Sts., Milwaukee, Wis.

BAUM'S Castorine Co., Rome, N. Y.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BROWN, T. C., 402 Mutual Life Bldg., Buffalo, N. Y.

CHILDS Co., The G. B., 499 Greenwich St., New York.

CLEANOLA Co. (The), Fulton Bldg., Pittsburg, Pa.

ERICKA Mfg. Co., Inc., Springfield, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FISK Mfg. Co., Springfield, Mass.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

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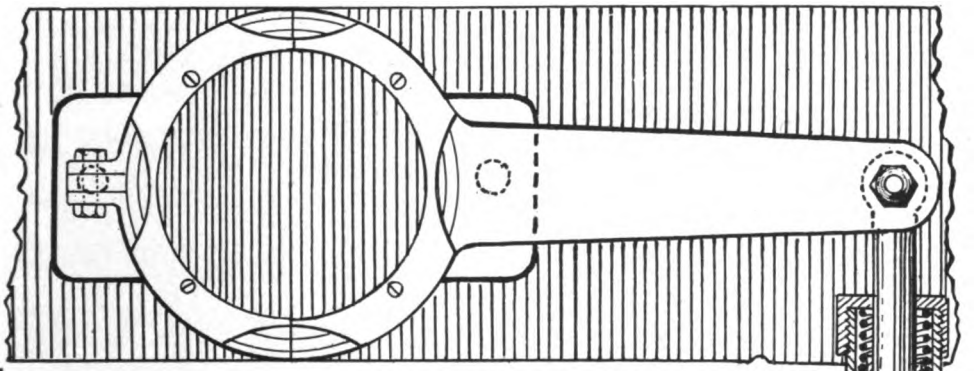

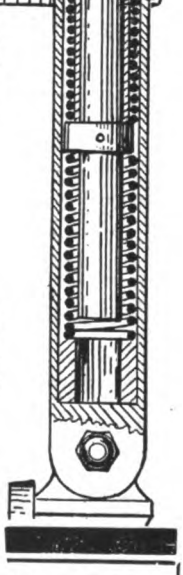

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It does not act on the springs under ordinary conditions but allows a movement of about two inches between axles and body before it begins to check the compression or rebound. This gives perfectly free and comfortable spring action on smooth roads—on rough roads, the band friction brake comes into action and checks the violent compression and recoil. Easily attached to side member of frame, by two bolts.

PRICES for all weights of cars **$60** DISCOUNTS to dealers

Write for Literature

VESTAL SHOCK ABSORBER CO.

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HASSLER Co., Owen C., 1543 Milwaukee Ave., Chicago, Ill.

HOLLINGSHEAD Co. (The) R. M., Camden, N. J.

HYDRO-Palm Soap Co., 22 Minott St., Neponsett, Mass.

JERGENS Co. (The), Andrew, Cincinnati, O.

KIRK & Co., J. S., Chicago, Ill.

KLENZENE Co., 1710 Market St., Philadelphia, Pa.

MODOC Co. (The), Foot of Market St., Chester, Pa.

MONAHAN Antiseptic Co., 92 Market St., Chicago, Ill.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

PURITAN Soap Co., 502 Exchange St., Rochester, N. Y.

ROME Soap Mfg. Co., Rome, N. Y.

SKAT Mfg. Co., 791 Park St., Hartford, Conn.

STANLEY, John T., 652 W. 30th St., N. Y. City (see page 129).

UTILITY Co. (The), 233 Greenwich St., N. Y. City.

WALTKE & Co., Wm., Grand and 2d St., St. Louis, Mo.

WHITE & Bagley Co. (The), 100 Foster St., Worcester, Mass.

SOLDER

DUNTON & Co., 65 Atlantic Ave., Providence, R. I.

GARDINER Metal Co., 454-456 W. Lake St., Chicago, Ill.

GROUT Bros. Automobile Co., Orange, Mass.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

SOLDERINE Co., 53 State St., Boston, Mass.

UNITED Wire & Supply Co., 109 Summer St., Providence, R. I.

WILDES, Thomts, 246 Water St., N. Y. City.

SPARK COILS

AMERICAN Coil Co., Inc., Foxboro, Mass.

AMERICAN Machine Mfg. Co., East Braintree, Mass.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOCOIL Co. (The), 132 7th St., Jersey City, N. J.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BROC-Barbier Auto Ignition Co., 143 W. 54th St., N. Y. City.

BYRNE-Kingston Co., Kokomo, Ind.

CONN. Telephone & Electric Co., Meriden, Conn.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 195).

DOW Portable Electric Co., Braintree, Mass.

DUPLEX Coil Co., Fond-du-Lac, Wis.

ELBRIDGE Electrical Co., Elbridge, N. Y.

ELECTRIC Contract Co., 202 Centre St., N Y. City.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FISCHER Special Mfg. Co., 2076 Reading Rd., Cincinnati, O.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

GEEN Electrical Mfg. Co., Inc., 183 E. Lake St., Chicago, Ill.

HARDY Co., R. E., New York, N. Y.

HEINZE Electric Co., Lowell, Mass. (se page 197).

HERZ & Co., 203-205 Lafayette St., N. Y. (Importers.)

KNOBLOCK-Heideman Mfg. Co., South Bend, Ind.

KOKOMO Electric Co., Kokomo, Ind.

MANHATTAN Electrical Supply Co., 17 Park Pl., New York.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

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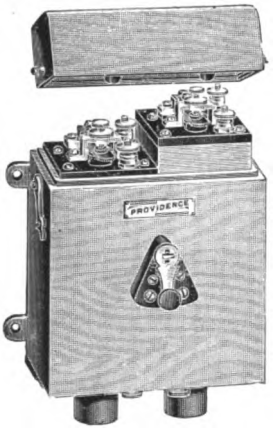


PROVIDENCE SPARK COILS

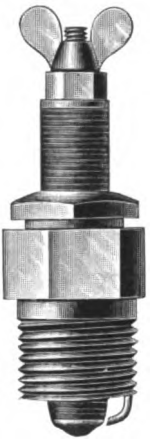
Are Best Because

They increase the horsepower of your engine.

They reduce your gasoline bill.

They consume less battery current than any other coil made.

THAT'S WHY YOU SHOULD HAVE ONE.



Our Dry Mica Plugs are unequalled.

Providence Ignition Apparatus will never disappoint you.

Providence Spark Coil Co.

Summer and Meadow Sts., PROVIDENCE, R. I.

PITTSFIELD COILS

It is totally unnecessary for anyone to be bothered with faulty ignition. PITTSFIELD SPARK COILS, TIMERS, SWITCHES and JEWEL MICA SPARK PLUGS will make the most refractory ignition get busy.

PITTSFIELD products may cost a little more than others. Mechanical excellence always comes high, but they more than compensate for the difference in first cost by their satisfactory service and their lasting qualities. Pittsfield Spark Coils are standard equipment on the

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STEVENS-DURYEA
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DORRIS ELMORE
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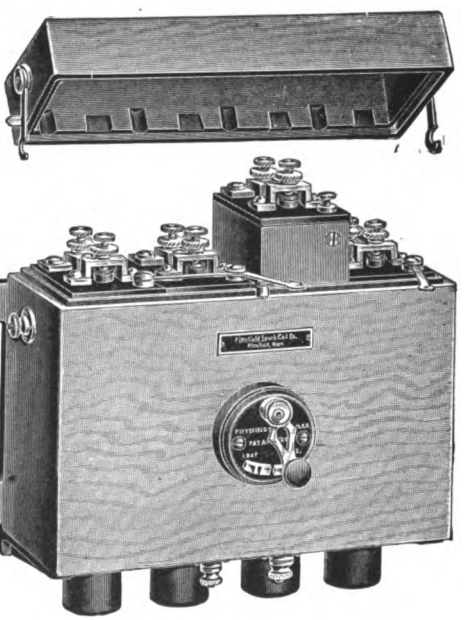
Let us send you our illustrated catalog and price-list of everything for the ignition.



PITTSFIELD SPARK COIL CO., P.O. Box 796, **Pittsfield, Mass.**

Eastern Distributing House, The New York Sporting Goods Co., 17 Warren Street, New York City

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NATIONAL Coil Co., Lansing, Mich. (see page 197).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEVER-Miss Spark Plug Co., Lansing, Mich.

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

NEW YORK Coil Co., 338-340 Pearl St., N. Y. City.

NOXON, C. Per Lee, 500 East Water St., Syracuse, N. Y.

NUNGESSER Electric Battery Co. (The), 21 King St., Cleveland, O.

OSHKOSH Electric Co., Oshkosh, Wis.

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 141).

POPE Mfg. Co., Hartford, Conn. (Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

PROVIDENCE Spark Coil Co., Summer and Meadow Sts., Providence, R. I. (see page 141).

QUEEN & Co., Inc., 8th and Arch Sts., Philadelphia, Pa.

ROCHE, Wm., 40 W. Broadway, N. Y. City.

RUBAY, Leon, 136 W. 38th St., New York. (Importers.)

RUPRECHT Electrical Co., 7117 Cedar Ave., Cleveland, O.

SCHUG Electric Co. (The), 326 Jefferson Ave., Detroit, Mich. (see page opposite).

SEIDLER-Miner Electric Co., Detroit, Mich. (see page 45).

SHERMAN-Lemke Coil & Supply Co., 106 Wisconsin St., Milwaukee, Wis.

SPLITDORF, C. F., 27 Vandewater St., New York (see page 205).

TRITT Electric Co., Union City, Ind.

U. S. Coil Co., Jersey City, N. J.

WILLIAMS, E. Q., 533 S. Clinton St., Syracuse, N. Y.

WILLYOUNG Appliance Co., Ludlow Station, Yonkers, N. Y.

SPARK GAPS

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

HERZ & Co., 203-205 Lafayette St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

SPARK PLUGS

AMERICAN Coil Co., Inc., Foxboro, Mass.

AMERICAN Machine Mfg. Co., East Braintree, Mass.

ARC Spark Mfg. Co., 125 W. 32d St., N. Y. City.

ARC-Toledo Spark Plug Co. (The), Toledo, O.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

ATLANTIC Motor Supply & Screw Co., 48 Binford St., Boston, Mass.

AUTO Appliance Co., 24 Mechanic St., Newark, N. J.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTO Novelty Co., Milwaukee, Wis. (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

B. & J. Mfg. Co., 3985 Cottage Grove Ave., Chicago, Ill.

BAIRD-Banks Mfg. & Supply Co., 35 Warren St., New York.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BENFORD, E. M., 33 So. 13th Ave., Mount Vernon, N. Y.

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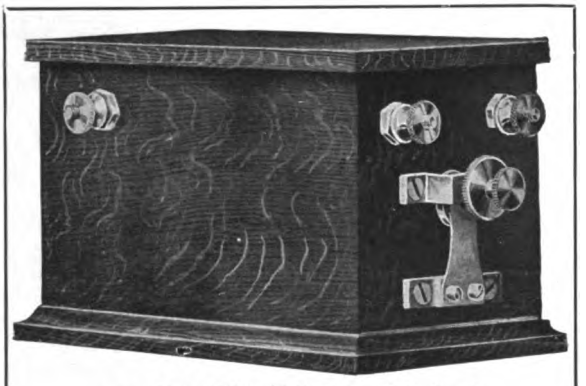
Schug Induction Spark Coils Electric Accessories Toledo Storage Battery

1907 LINE



1907 Model Schug Coil, Extra High Speed

We emphasize SCHUG because we want to impress upon you ITS importance as allied to electric manufacture.

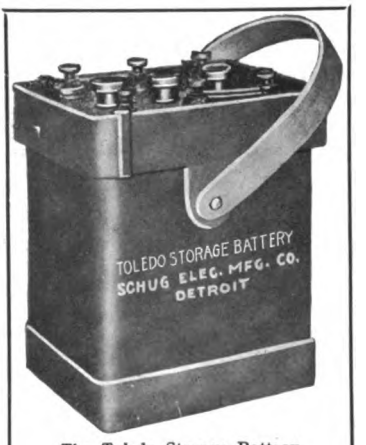
Schug Dependability! That's our aim. Each individual Coil, Plug, Magneto, etc., is made as if SCHUG reputation depended on it alone Each Accessory could be featured for its efficiency just as boldly as the above three articles for their efficiency.

SCHUG INDUCTION SPARK COILS have been proved "tried and true." Their reliability has standardized them among motor boat and automobile enthusiasts. They are primarily dependable, built to get all the speed possible out of your engine.

SCHUG REPRESENTS THE TOLEDO STORAGE BATTERY because it too is known by its Dependability — adapted for daily service and hard usage for both motor boat and motor vehicle.

SCHUG ACCESSORIES, among which the Double Core Mica Plug and Schug Timers have been so highly commended, are all as perfect as the Schug Speed Coil.

OUR TIMERS are Ball Bearing — made in two styles — and superior to any others on the market.



The Toledo Storage Battery

We also make:

Spark Coils	**Timers**	**Primary Wire**	**Storage Batteries**	**Magnetos**
Mica Spark Plugs	**Switches**	**Secondary Wire**	**Ignition Dynamos**	**Portable Battery Lamps**

Our Descriptive Booklet with Practical Hints on the Use and Care of Induction Spark Coils sent on request

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SPARK PLUGS (Continued)

BIG 4 Spark Plug Co., 104 John R St., Detroit, Mich. (see page 105).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BROC-Barbier Auto Ignition Co., 143 West 54th St., N. Y. City.

BYRNE, Kingston Co., Kokomo, Ind.

CHARTER & Co., 46 Plymouth St., Chicago, Ill.

CLIMAX Igniter Co., Amesbury, Mass.

DAYTON Electrical Mfg. Co. (The), 87 St. Clair St., Dayton, O. (see page 105).

DELTA Mfg. Co., Bloomfield, N. J.

DE LUXE Mfg. Co., Buffalo, N. Y.

DIEBEL, Wm., 904 Lippincott Bldg., Philadelphia, Pa.

DOW Portable Electric Co., Braintree, Mass.

DUPLEX Ignition Co., Inc., 1555 Broadway, N. Y. City.

ELBRIDGE Electrical Mfg. Co., Elbridge, N. Y.

EXCELSIOR Spark Plug Co., Cleveland, O.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FISCHER Special Mfg. Co., 2076 Reading Rd., Cincinnati, O.

FOURFORONE Spark Plug Co., 23 E. Lake St., Chicago, Ill.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

FRY Co., T. C. & W. L., 800 Chestnut St., Rochester, Pa.

GEEN Electrical Mfg. Co., Inc., 183 E. Lake St., Chicago, Ill.

GERSON-Carey Co., Lansing, Mich.

GILBOUGH, B. G., 36 La Salle St., Chicago, Ill.

GRANT Mfg. & Machine Co., 90 Silliman St., Bridgeport, Conn.

HARDY Co., R. E., 86 Watt St., N. Y. City.

HOLCOMBE & Co., 45 Vesey St., N. Y. City.

ILLINOIS Roofing & Supply Co., 23 Lake St., Chicago, Ill.

IGNITER Appliance Co., 133 Central Ave., Cleveland, O.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

KENT Spark Plug Co., 57 Rogers Ave., Brooklyn, N. Y.

KNOBLOCH-Heideman Mfg. Co., South Bend, Ind.

KOKOMO Electric Co., Kokomo, Ind.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (see page 101).

MECHANICAL Plug Co., St. Louis, Mo.

METAL Specialties Mfg. Co., 18-24 W. Randolph St., Chicago, Ill.

MEZGER, C. A., Inc., 203 W. 80th St., N. Y. City (see page 9).

MOSLER, A. R., & Co., 163 W. 29th St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEVER-Miss Spark Plug Co., Lansing, Mich.

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

NORTH & Pfeiffer Mfg. Co., 72 Chestnu St., New Britain, Conn.

OAKES & Dow Co., 15 Chardon St., Boston. Mass.

ORSWELL Ignition Co. (The), 102 Pearl St., Boston, Mass.

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 141).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

PROVIDENCE Spark Coil Co., Summer and Meadow Sts., Providence, R. I. (see page 141).

PURITAN Machine Co., 12 Gratiot Ave., Detroit, Mich.

RAJAH Auto-Supply Co., 147 Washington St., New York.

REX Motor Co., 69 Woodward Ave., Detroit. Mich.

RICHARDSON Engineering Co., Hartford, Conn. (see page opposite).

ROCHE, Wm., 40 W. Broadway, N. Y. City.

RUBAY, Leon, 136 West 38th St., New York (Importer).

SCHUG Electric Mfg. Co. (The), 326 Jefferson Ave., Detroit, Mich. (see page 143).

SCHULTZ Co., The G. J., 3 West Broadway, N. Y. City (see page 217).

SEIDLER-Miner Electric Co., 205-209 Jefferson Ave., Detroit, Mich. (see page 45).

SHERMAN-Lemke Coil & Supply Co., 106 Wisconsin St., Milwaukee, Wis.

SPLITDORF, C. F., 27 Vandewater St., New York (see page 205).

STANDARD Co. (The), Torrington, Conn.

STEVENS & Co., 99 Chambers St., New York.

THURSTON Mfg. Co. (The), 356 E. 57th St., Chicago, Ill.

TRITT Electric Co., Union City, Ind.

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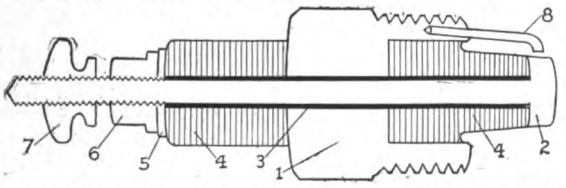
"RICH SPARK" PLUG

MOST PRACTICAL PLUG On the Market

ABSOLUTELY CANNOT BLOW OUT

No Shellac used in any part
Mica Finely Polished and stays so



(1) Brass shell (state make of Auto when ordering); (2) Firing pin, steel; (3) Best India sheet mica wrapped around 2 enough turns to give perfect insulation; (4) Best mica disks fit around 3 closely and forced together under great pressure; (5) Copper washer; (6) Brass nut to keep washer in place; (7) Thumb screw for wire or terminal; (8) Spark pin, non-corrosive alloy.

It has double insulation and from its construction it can be seen that pressure from inside the cylinder only tends to make it tighter. Note this plug is partly chambered, and yet the insulation projects out far enough to allow easy cleaning and to get the spark well into the cylinder, thus increasing the power of the engine. No packing is used, therefore none to loosen up or blow out.

PRICE, $1.00, and worth twice the money

Richardson Engineering Co., Hartford, Conn.

Liberal discount to manufacturers and dealers Write us

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U. S. Coil Co., 60 Harrison Ave., Jersey City, N. J.

UTILITY Co. (The), 332 Broadway, New York.

WILLYOUNG Appliance Co., Ludlow Sta., Yonkers, N. Y.

SPARKING POINTS

AMERICAN Platinum Wks., 251 N. J. R. R. Ave., Newark, N. J.

BAKER & Co., Inc., 408-414 N. J. R. R. Ave., Newark, N. J.

BOKER & Co., Herman, 101 Duane St., N. Y. City.

CROSELMIRE & Ackor Co., 42 Walnut St., Newark, N. J.

IDIUM Metals Co. Boston, Mass. (see page 125).

QUEEN & Co., Inc., 8th and Arch Sts., Philadelphia, Pa.

SPARK TIMING DEVICES

ALTEMUS & Co., C. L., Fourth and Locust Sts., Philadelphia, Pa.

AMERICAN Coil Co., Inc., Foxboro, Mass.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTO Appliance Co., 24 Mechanic St., Newark, N. J.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers (see page 63).

AUTO Instrument Co., 228 No. 4th St., Philadelphia, Pa.

AUTO & Power Appliance Co. (The), Cleveland, O. (see page 21).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BEMUS, Inc., Alton T., 133 Oliver St., Boston, Mass.

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BLACK, A. B., 21 S. Market St., Boston, Mass.

BROC-Barbier Auto Ignition Co., 143 West 54th St., N. Y. City.

BURTT Mfg. Co., Kalamazoo, Mich.

CROUSE-Hinds Co., Syracuse, N. Y.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 105).

DODGE Lubricator Co., 8 Waltham St., Boston, Mass.

DOMINICK & Co., Wm., 542-544 Wabash Ave., Chicago, Ill.

DOW Portable Electric Co., Braintree, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

FULMER, C. F., Plainfield, N. J.

HAWKINS Mfg. Co., 508 Atlantic Ave., Boston, Mass.

HEINZE Electric Co., Lowell, Mass. (see page 197).

HERZ & Co., 203-205 Lafayette St., New York.

ILLINOIS Auto & Parts Co., Globe and Main Sts., Peoria, Ill.

KENT Mfg. Works, Atwater, 50 North 6th St., Philadelphia, Pa. (see page 29).

KOKOMO Electric Co., Kokomo, Ind.

LINDSAY, A. M., Jr., 523 Granite Bldg., Rochester, N. Y.

MILWAUKEE Auto. Eng. & Supply Co., 706 Winnebago St., Milwaukee, Wis.

MONITOR Speed Recorder Co., 274 Pearl St., Cambridge, Mass.

MOSLER & Co., A. R., 163 West 29th St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEWCOMB, A. H., 282 N. Robey St., Chicago, Ill.

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 141).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

POWELL Muffler & Timer Co., 42 La Fayette St., Utica, N. Y. (see page 117).

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill. (see page 109).

QUAD Mfg. Co. (The), 35-37 S. Scioto St., Columbus, O. (see page opposite).

SINTZ, Guy L., Grand Rapids, Mich.

UNCAS Specialty Co., 25 Shipping St., Norwich, Conn.

WAUKESHA Motor Co., 119 North St., Waukesha, Wis.

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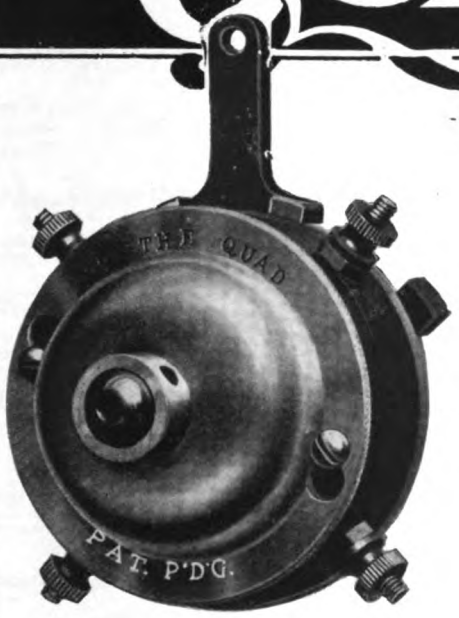
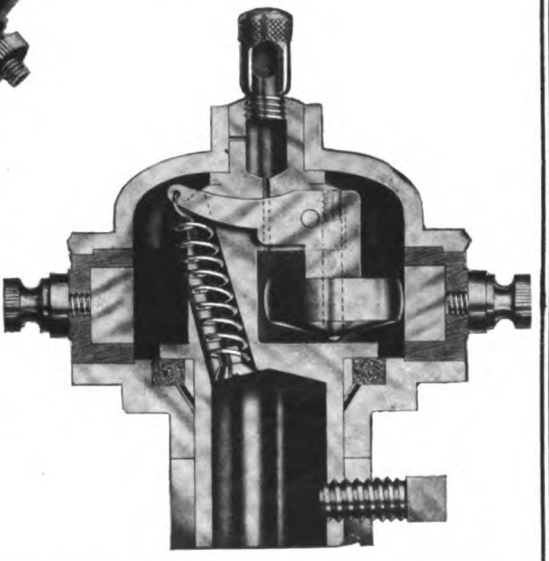
The QUAD Timer



A masterpiece of modern inventive ingenuity, every detail finished and constructed in a superlatively high degree under our own patents.

When you have used one of our timers we will have proved to you that our timers are like our business methods—right up to the minute.

Our timer is small, neat, compact, with double bearing to eliminate the eccentric wear on one journal, crowned roller supported in a position to allow the centrifugal force to insure a perfect contact.



Self-oiling, actually dust-proof, perfectly noiseless, delivers the full current from the batteries to the coil, and is guaranteed to show higher efficiency than any other timer on the market.

We will send a sample timer to responsible concerns and if it is not as represented it can be returned at our expense.

Liberal discounts to the trade and special inducements to the manufacturers.

Think This Over and Write Us

The QUAD MFG. CO.

35-37 SOUTH SCIOTO ST.,
COLUMBUS, OHIO.

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WESTERN Motor Co., Logansport, Ind.

WILLYOUNG Appliance Co., Ludlow Station, Yonkers, N. Y.

YOUSE, E. S., Reading, Pa.

SPECIAL PARTS (See Machine Work to Order)

SPEED INDICATORS (See Indicators, Speed and Distance)

SPRINGS (Leaf)

ANSTED Spring & Axle Co., Connersville, Ind.

ARMSTRONG Mfg. Co. (The), J. B., Flint, Mich.

CLEVELAND-Canton Spring Co. (The), Canton, O.

DELANEY, D., & Son, Liberty and Hamilton Sts., Newark, N. J.

DETROIT Steel Products Co., 141 St. Antoine St., Detroit, Mich. (see front cover).

FOREST City Spring Works, Cleveland, O.

GARDEN City Spring Works, 2000 Purple St., Chicago, Ill.

HARVEY Spring Co., Racine, Wis.

HESS-Pontiac Spring & Axle Co., Pontiac, Mich.

KALAMAZOO Spring & Axle Co., Kalamazoo, Mich.

KEYSTONE Spring Wks., Inc., 13th and Buttonwood Sts., Philadelphia, Pa.

LEWIS Spring & Axle Co., Jackson, Mich.

MERRILL Spring Co., E. R., 530 West 28th St., New York.

PENN Spring Wks., Baldwinsville, N. Y.

PERFECTION Spring Co., 2414-2420 Superior Ave., N. W., Cleveland, O. (see page 207).

ROWLANDS, Wm. & Harvey, Frankford, Philadelphia, Pa.

RYMAN Co., K. L., 164 Market St., Newark, N. J.

SHULER, Davis W., & Son, Amsterdam, N. Y.

SPRING Perch Co., 232 John St., Bridgeport, Conn.

TROY Spring Works, 394-96 Congress St., Troy, N. Y.

TUTHILL Spring Co., 213 W. Polk St., Chicago, Ill. (see page 207).

WAUGH, T. Milton, 1525 Monadnock Blk., Chicago, Ill.

SPRINGS (Cushion and Machinery)

AMERICAN Steel & Wire Co., Chicago, Ill.

BARBER Mfg. Co., Anderson, Ind.

BOWERS Metal Stamping Co., 718 East 11th St., N. Y. City.

CARY Spring Works, 240 W. 29th St., N. Y. City.

CLEVELAND Wire Spring Co., Cleveland, Ohio.

D'ARCY Spring Co., Kalamazoo, Mich.

DETROIT Wire Spring Co., Detroit, Mich. (see page opposite).

DUNBAR Bros., Bristol, Conn.

EUREKA Spring Co., 347 Broadway, N. Y. City.

GIBSON Co., Wm. D., Huron and Kingsbury Sts., Chicago, Ill. (see page opposite).

HEBB, George A., 70 William St., Newark, N. J.

HUBBARD Spring Co., M. D., Pontiac, Mich. (see page opposite).

INDEPENDENT Steel & Wire Co., House Bldg., Pittsburg, Pa.

JACKSON Cushion Spring Co., Water St., Jackson, Mich.

MILLER & Van Winkle, 18 Bridge St., Brooklyn, N. Y.

MORGAN Spring Co., Worcester, Mass.

NATIONAL Spring & Wire Co., Albion, Mich.

NEWMAN Wire Co., C., 143 Liberty St., New York.

NEW YORK Wire & Spring Co., Hoboken, N. J.

RAYMOND Mfg. Co., Corry, Pa.

SHELDON Spring Co., Wilkes Barre, Pa.

STAPLES & Hanford, Newburgh, N. Y.

THOMPSON, F. H., 36-38 Elm St., Portland, Me.

VENTILATED Cushion & Spring Co., Fisher Bldg., Chicago, Ill.

WALLACE Barnes Co. (The), Bristol, Conn. (see page opposite).

WINDSOR Spring Co. (The), Kenosha, Wis.

WING Co., Charles, Amesbury, Mass.

SPRINGS (Supplementary) (See Shock Absorbers)

SPROCKETS

ADAPT Machinery Co. (The), 17th St. and Wabash Ave., Chicago, Ill.

Baldwin Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (see page 177).

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Inlet and Exhaust Valve Springs

sometimes cause trouble. We try to produce springs which overcome this.

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Springs of any
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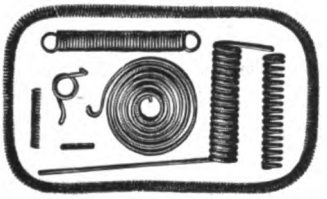
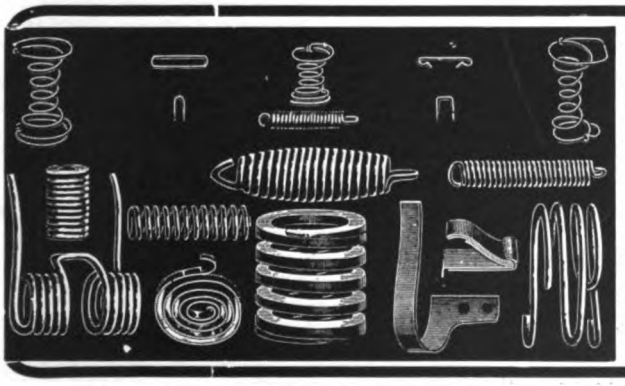
for any Purpose



Coil Springs
Extensions
Compression
Torsion

M. D. HUBBARD SPRING COMPANY
Pontiac, Michigan



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Huron and Kingsbury Sts., Chicago
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Steel, Brass and Phosphor Bronze
Special Shapes and Sizes to meet all requirements of Automobile Makers.

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BILLINGS & Spencer Co., Russ and Lawrence Sts., Hartford, Conn.

BOSTON Gear Wks., Norfolk Downs, Mass.

COLLMER Bros., 105 Vistula Ave., South Bend, Ind.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

CULLMAN Wheel Co., 1030 Dunning St., Chicago, Ill. (see page 91).

DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapolis, Ind. (see page 61).

FORG, Peter, Park St., Somerville, Mass.

GARFORD Co. (The), Elyria, O.

GRANT Gear Wks., 6 Portland St., Boston, Mass.

HYDRAULIC Pressed Steel Co., Cleveland, O. (see inside back cover).

PARISH & Bingham Co., Cleveland, O. (see page 77).

SPACKE Mach. Co. (The), F. W., Indianapolis, Ind. (see page 63).

MOSSBERG Co., Frank, Attleboro, Mass.

PARISH & Bingham Co. (The), Cleveland, O. (see page 77).

PITTSBURG Gauge & Supply Co., 309 Water St., Pittsburg, Pa.

SCHAEFER & Bundenberg Mfg. Co., Foxboro, Mass.

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

SIDNEY Mfg. Co., 5300 Armour Ave., Chicago, Ill.

SIMMONS, John, Co., 101 Centre St., N. Y. City.

SMITH Co., A. O., Milwaukee, Wis.

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

STAR Brass Mfg. Co., 108 E. Dearborn St., Boston, Mass.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WESTERN Instrument Co., 18-30 W. Randolph St., Chicago, Ill.

WORCESTER Pressed Steel Co., Worcester, Mass.

STAMPINGS

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (see page 45).

BAY State Stamping Co., Worcester, Mass.

BOWEN Mfg. Co., Auburn, N. Y.

CASSADY-Fairbank Mfg. Co., 6106 La Salle St., Chicago, Ill.

CRISPIN Sheet Metal Mfg. Co., 3038-3046 Chestnut St., Philadelphia, Pa.

CROSBY Co. (The), 185 Pratt St., Buffalo, N. Y.

DAVIS & Buxton, Worcester, Mass.

DIAMOND Stamped Ware Co., Detroit, Mich.

EATON, Cole & Burnham, 253 B'way, N. Y. City.

FORSYTH Mfg. Co., 308 Terrace, Buffalo, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page opposite).

HANCOCK Inspirator Co., 85 Liberty St., N. Y. City.

HYDRAULIC Pressed Steel Co., Cleveland, O. (see inside back cover).

JANNEY, Steinmets & Co., Philadelphia, Pa. (see page opposite).

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

MACK Mfg. Co., Thos. A., 401-417 St. Paul Ave., Jersey City, N. J.

MATTHEWS, H. A., Mfg. Co., Seymour, Conn.

METAL Specialties Mfg. Co., 18-24 W. Randolph St., Chicago, Ill.

STARTERS (Automatic)

AUTO Improvement Co., 316 Hudson St., New York City.

BALL, F. H. & F. O., Plainfield, N. J.

KANE Starting Device Co., 762 Junction Ave., Detroit, Mich.

MILNE Auto-Start Co., 812 4th Ave., Detroit, Mich.

STEEL

AMERICAN Sheet Steel Co., 24 State St., N. Y. City.

AMER. Tube & Stamping Co., Bridgeport, Conn.

BASSETT & Presley Co., Cleveland, O.

BOKER & Co., Herman, 101 Duane St., N. Y. City.

BROOKEBANK, Mullin & Co., 409 Commerce St., Philadelphia, Pa.

CARPENTER Steel Co., Reading, Pa.

COLUMBIA Steel Co., Elyria, O.

CRUCIBLE Steel Co. of America, Empire Bldg., Pittsburg, Pa.

ELIOTT-Blair Steel Co., Taylor and Mercer Sts., New Castle, Pa.

FARIST Steel Co. (The), 137 E. Main St., Bridgeport, Conn.

FINISHED Steel Co. (The), 1623 Wilson Ave., Youngstown, O.

JONES & Laughlins Co., Pittsburg, Pa.

LUKENS Steel Co., Coatsville, Pa.

MIDVALE Steel Co., Philadelphia, Pa.

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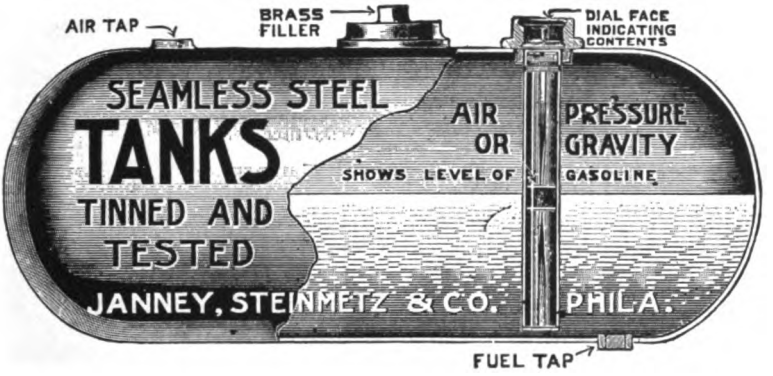

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MORRIS & Bailey Steel Co., Ger. Nat'l Bank Bldg., Pittsburg, Pa.

NASH, Geo., & Co., 224 Pearl St., N. Y. City.

PARDEE, C., Wks. (The), Perth Amboy, N. J.

PROSSER & Sons, Thos., 15 Gold St., N. Y. City.

REPUBLIC Iron & Steel Co., Stock Exchange Bldg., Chicago, Ill.

ROYAL Metal Steel Co., Inc., 24 State St., N. Y. City (see page opposite).

STANDARD Gauge Steel Co., Beaver Falls, Pa.

SUPERIOR Steel Co., Carnegie, Pa.

UNION Drawn Steel Co., Beaver Falls, Pa.

WARD, Edgar T. & Sons, 25 Purchase St., Boston, Mass.

STEEL (Chrome-Nickel)

BETHLEHEM Steel Co., So. Bethlehem, Pa.

CARPENTER Steel Co., Reading, Pa.

COLUMBIA Steel Co., Elyria, O.

GAUTIER & Co., D. G., 20 Cliff St., New York.

JOHNSON & Co., Isaac G., Spuyten Duyvil, New York.

MIDVALE Steel Co., Philadelphia, Pa.

ORFORD Copper Co., 43 Exchange Place, N. Y. City.

PARISH Mfg. Co., 7th and Chestnut Sts., Reading, Pa.

PROSSER & Sons, Thomas, 15 Gold St., New York (Importers).

ROYAL Metal Steel Co., Inc., 24 State St., N. Y. City (see page opposite).

TINDEL-Morris Co., Eddystone, Pa.

STEEL SHAFTING

CUMBERLAND Steel Co., Cumberland, Md.

PITTSBURG Steel Shafting Co., Braddock, Pa.

UNION Drawn Steel Co., Beaver Falls, Pa.

STEEL STAMPS AND STENCILS

CHANDLER Co. (The), 31 Taylor St., Springfield, Mass.

MURDOCK, Jr., Co., Jas., 116 Opera Pl., Cincinnati, O.

QUINT, S. H., & Sons, 15 S. 4th St., Philadelphia, Pa.

ROBBINS Mfg. Co., John, 58 Kneeland St., Boston, Mass.

SMITH Mfg. Co., R. H. (The), Springfield, Mass. (see page 89).

STEEL WOOL

AMERICAN Steel Wool Co., 451-453 Greenwich St., N. Y. City.

BUEHNE Steel Wool Co. (The), 93 Nassau St., N. Y. City.

STEERING APPARATUS

AMERICAN Ball Bearing Co., Cleveland, Ohio.

ATLAS Drop Forge Co., Lansing, Mich.

BARNES Gear Co., Oswego, N. Y.

BILLINGS & Spencer Co., Russ and Lawrence Sts., Hartford, Conn.

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 119).

BOSTON Gear Wks., Norfolk Downs, Mass.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 133).

BROWN-Lipe Gear Co., Syracuse, N. Y.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 69).

COLUMBUS Screw & Machine Co., Columbus, O.

ELYRIA Machine Parts Co. (The), Elyria, Ohio.

GARFORD Co. (The), Elyria, O.

GEMMER Engine Co., Wabash, Ind.

GENERAL Electric Co., Schenectady, N. Y.

LEE Mfg. Co., Port Huron, Mich.

McCUTCHEON Gear & Mfg. Co., 205 W. South St., Indianapolis, Ind.

MILNE, Frank, Everett, Mass.

MORSE, Williams & Co., West End Trust Bldg., Philadelphia, Pa.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 41).

ROSS Gear & Tool Co., 849 Main St., Lafayette, Ind.

SMITH, Chas. A., Church Lane & P. & R. Ry., Germantown, Philadelphia, Pa.

TIMKEN Roller Bearing Axle Co., Canton, O.

WARNER Gear Co., Muncie, Ind.

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EASY TO DROP FORGE AND TO MACHINE

Treatment doubles elastic limit and tensile strength.

The tensile strength of our Chrome Nickel Steel is 136,400 lbs. per square inch and the elastic limit is 127,680 lbs. per square inch.

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High Speed Steel

This steel differs greatly from other air-hardening steels, in that it is much easier to work in annealing, forging and hardening, being strictly uniform, and will take at excessively high speeds very heavy cuts and feeds without drawing its temper.

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STEERING WHEELS

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J. (see page 15).

AMER. Wood Rim Co., Bradford, Pa.

BRYANT & Berry Co., 34 W. Atwater St., Detroit, Mich.

BYRNE, Kingston & Co., Kokomo, Ind.

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 69).

CENTAUR Motor Co., 59 Franklin St., Buffalo, N. Y.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

GARFORD Co. (The), Elyria, O.

GOERSS, Herman, 162 Russell Ave., Cleveland, O.

JAMESVILLE Mfg. Co., Jamesville, N. Y.

MEYER, Morris F., 65-67-69 East Woodbridge St., Detroit, Mich. (see page 135).

McCUTCHEON Gear & Mfg. Co., 205 W. South St., Indianapolis, Ind.

MUNCIE Auto Parts Co., Elliot St. and L. E. & W. R. R., Muncie, Ind.

RASTETTER & Son, Ft. Wayne, Ind.

TUCKER Wood Work Co., Sidney, O.

STEERING WHEELS (Rubber)

DIAMOND Tire Co., Akron, O. (see page 209).

STEPS

BILLINGS & Spencer Co., Russ and Lawrence Sts., Hartford, Conn.

BLAKESLEE Forging Co., Plantsville, Conn.

DRUEN, B. D., 71 Hamilton St., New Haven, Conn.

HAYES Mfg. Co. (The), 360-70 Maybury Ave., Detroit, Mich. (see page 43).

HYDRAULIC Pressed Steel Co., Cleveland, O. (see inside back cover).

QUINCY, Manchester, Sargent Co., 84 Van Buren St., Chicago, Ill. (see page 193).

RUBBER Step Mfg. Co., Exeter, N. H.

SMITH, H. D., & Co., Plantsville, Conn.

STRIEBY & Foote Co., 301 Ogden St., Newark, N. J.

WESTERN Automatic Machine Screw Co. (The), Elyria, O.

WING Co. (The) Chas., Amesbury, Mass.

STORM SHIELDS (See Aprons, Storm)

STRAINERS (Gasoline)

CAMBRIA Forge Co., Cleveland, O., and Johnstown, Pa. (see page 69).

CENTURY Specialty Co., 401 Deshler Ave., Columbus, O.

CLARK, E. P., Arcade, Utica, N. Y.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (see page 5).

KAUFMANN, Chas., 45 So. Main St., Oshkosh, Wis.

LUNKENHEIMER Co. (The), Cincinnati, O.

MOTOR Car Specialty Co., Fidelity Mutual Bldg., Philadelphia, Pa.

TURNER Brass Wks., 72 Michigan St., Chicago, Ill. (see page 79).

UNCAS Specialty Co., 25 Shipping St., Norwich, Conn.

WILLIAMS Valve Co., D. T., 904-910 Broadway, Cincinnati, O.

WINKLEY Co. (The), Detroit, Mich.

SUPPLIES (Dealers and Jobbers)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (see page 107).

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (see page 75).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (see page 17).

POPE Mfg. Co., Hartford, Conn. (see page 131).

POST & Lester Co. (The), Hartford, Conn. (see page 127).

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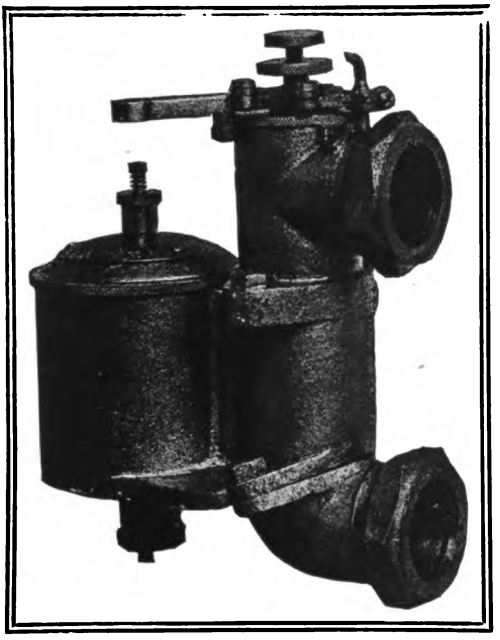
The BUFFALO CARBURETOR

BY ALL TESTS PROVED THE BEST



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ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTO Appliance Co., 24 Mechanic St., Newark, N. J.

AUTO Lock Co., 6546 Minerva Ave., Chicago, Ill.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

B. & J. Mfg. Co., Chicago, Ill.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BROC-Barbier Auto Ignition Co., 143 W. 54th St., N. Y. City.

BYRNE, Kingston & Co., Kokomo, Ind.

CONN. Telephone & Electric Co., Meriden, Conn.

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. (see page 105).

DOW Portable Electric Co., Braintree, Mass.

ELDREDGE Elec. Mfg. Co., 7 Post Office Square, Springfield, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

GOEBEL, F. A., Marietta, O.

HART & Hegeman Mfg. Co., Hartford, Conn.

HERZ & Co., 203-205 Lafayette St., New York.

KOKOMO Electric Co., Kokomo, Ind.

McKIBBIN Mfg. Co., South Norwalk, Conn.

MORE-Power Co., 619 Gorham St., Lowell, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 141).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

REMY Electric Co., Anderson, Ind.

SCHUG Electric Mfg. Co. (The), 326 Jefferson Ave., Detroit, Mich. (see page 143).

SEIDLER-Miner Electric Co., 205-209 Jefferson Ave., Detroit, Mich. (see page 45).

SPECIALTY Mfg. Co., South Norwalk, Conn.

SPLITDORF, C. F., 27 Vandewater St., New York (see page 205).

WESTERN Electric Co., 269 So. Clinton St., Chicago, Ill.

SWITCHES (Lock)

AMERICAN Coil Co., Inc., Foxboro, Mass.

AUTO Appliance Co., 24 Mechanic St., Newark, N. J.

AUTO-Lock Plug Co., Inc., 31 Nassau St., N. Y. City.

BRANDOW, Frank W., 86 North St., Pittsfield, Mass.

GOEBEL, F. A., Marietta, O.

LOCK Switch Mfg. Co., 20 Broad St., N. Y. City.

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 141).

TACHOMETERS (See Indicators, Speed and Distance)

TANKS

AVERY Stamping Co., 5209 Lakeside Ave., Cleveland, O. (see page 45).

A-Z Co. (The), 527 West 56th St., N. Y. City.

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BOWSER & Co., S. F., Ft. Wayne, Ind. (see page 159).

BOYD, James, 73 39th St., Brooklyn, N. Y.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 133).

DETROIT Auto Specialty Co., Detroit, Mich. (see page 89).

DIAMOND Stamped Ware Co., Detroit, Mich.

FEDDERS Mfg. Works, Buffalo, N. Y. (see page 133).

FREELAND Sons Co., B. F., Sturgis, Mich.

GETCHELL, S. S., & Sons, Woonsocket, R. I.

GLEASON-Peters Air Pump Co., Mercer and Houston Sts., New York, N. Y.

GRAY & Sons, Peter, 90 Union St., Boston, Mass.

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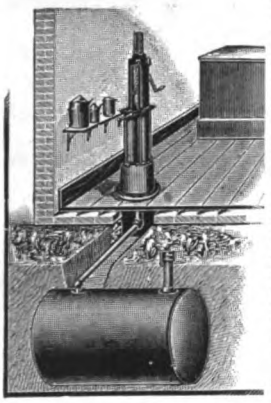
The National Long Distance Gasoline Storage Outfit which permits of placing the supply tank under ground, the pump being inside the building. In perfecting this outfit we have observed to the letter the rules of the underwriters' Laboratories, and can recommend it to be the safest and most economical way of handling gasoline ever devised.



This pump is one of our latest Double Cylinder, which in operating there is no lost motion, every movement of the handle pumps and measures oil, saving time, labor and money.

This outfit is especially designed for Automobile Garages

Ask for Catalogue

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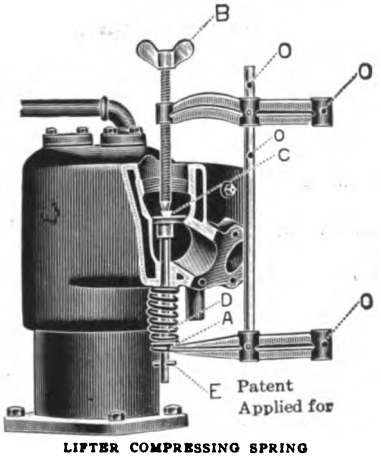

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Save Your Hands Save Time

Two Minutes to Remove Valve

W. & N.

Valve Lifter

It compresses the Spring and Lifts Washer so Key can be removed

No Loss of Patience No Injury to Hands
Simple Durable Practical

No owner of an Auto, Motor Boat, Gas or Gasoline Engine, or Garage as well, can afford to be without it.

Price, $2.00

DIRECTIONS

Place Fork "A" beneath washer or in coil of Spring "D." Turn Thumb Screw "B" until point sets on top of Valve "C." Then screw down until Spring "D" is compressed enough to remove Key "E"

To remove, back up on Screw "B," remove lifter and take out valve, so that necessary grinding, etc., can be done

To replace valve back in position, simply reverse above instructions.

"O" represents adjusting holes for different lengths of cylinders and to get over or under exhaust pipes.

AUTOMOBILE SPECIALTY CO. (Not Inc.)

A. J. JACKSON, Manager **Room 509 Willoughby Building, CHICAGO, ILL.**

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HAYES Mfg. Co., 360-70 Maybury Ave., Detroit, Mich. (see page 43).

IRONCLAD Mfg. Co., Brooklyn, N. Y.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

KELLS, W. J., Mfg. Co., Jersey City, N. J.

KINSEY Mfg. Co., Dayton, O.

KIRK-Latty Co., Cleveland, O.

KOVEN & Brother, L. O., 50 Cliff St., New York.

MANUFACTURERS' Can Co. (The), 132-36 Mulberry St., Newark, N. J.

MAYO Radiator Co., New Haven, Conn. (see page 89).

MULLINS Co., The W. H., Salem, O.

MURREY & Murrey, 113 Allegan St., E., Lansing, Mich.

NATIONAL Oil Pump & Tank Co. (The), Dayton, O. (see page 157).

NORTMANN-Duffke Foundry Co., 26th & Layton Ave., Milwaukee, Wis.

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

PRESSED Steel Tank Co., Milwaukee, Wis.

PURSELL Mfg. Co., P. M., 802 Beecher St., Indianapolis, Ind. (see page 89).

STANDARD Welding Co. (The), Cleveland, O.

TRAGESER Steam Copper Wks., John, 447-457 W. 26th St., New York.

WESTERN Oil Pump Co., 2447 Kosciusko St., St. Louis, Mo.

WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill. (see page opposite).

WRIGHT Cooler & Hood Mfg. Co., Chicago, Ill.

TANKS (Gas Generating)

AMERICAN Generator Co. (The), 63d St. and Park Ave., N. Y. City.

TANKS (Storage)

AMERICAN Steel Barrel Co., 204-206 Varet St., Brooklyn, N. Y.

BOWSER & Co., S. F., Ft. Wayne, Ind. (see page opposite).

BOYER-Radford & Gordon Tank & Pump Co., Dayton, O.

BROWN Oil Can Co., Dawson St., Toledo, O.

EASTERN Oil Tank Co., 136 Fletcher St., Lowell, Mass. (see page 125).

FREELAND Sons Co., B. F., Sturgis, Mich.

GETSCHELL, S. S., & Sons, Woonsocket, R. I.

GILBERT & Barker Mfg. Co., 82 John St., N. Y. City.

GLEASON-Peters Air Pump Co., Mercer and Houston Sts., N. Y. City.

HYDRAULIC Oil Storage & Distributing Co., 820 Penobscot Bldg., Detroit, Mich.

IRONCLAD Mfg. Co., 204 Varet St., Brooklyn, N. Y.

KALTENBACH, Fred, 12 N. Jefferson St., Chicago, Ill.

NATIONAL Oil Pump & Tank Co. (The), Dayton, O. (see page 157).

SAFETY Tank Co., 25 W. 42d St., N. Y. City.

STOUTENBOROUGH, X., 277 Pearl St., N. Y. City.

TOKHEIM Mfg. Co., Cedar Rapids, Iowa.

WESTERN Oil Pump Co., 2447 Kosciusko St., St. Louis, Mo.

WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill. (see page opposite).

TAPER PINS (See Screw Machine Products)

TIMERS (See Spark Timing Devices)

TIRES (Cellular)

BROOKE, M. E., Denver, Colo.

MILWAUKEE Rubber Works Co., Cudahy, Wis.

RUBBER Tire Co. (The), 1215 Arch St., Philadelphia, Pa.

VOORHEES Rubber Mfg. Co., Bostwick Ave., Jersey City, N. J.

TIRES (Cushion)

PUNCTUREPROOF Tire Co. (The), American Trust Bldg., Cleveland, O.

TIRES (Leather)

AMERICAN Tire Co., Owosso, Mich.

CENTRAL Leather & Rubber Tire Works, 238-240 W. 50th St., N. Y. City.

HEALY Leather Tire Co., 88 Gold St., New York.

SAMPSON Leather Tire Co., 1634-1642 Broadway, N. Y. City (see page 167).

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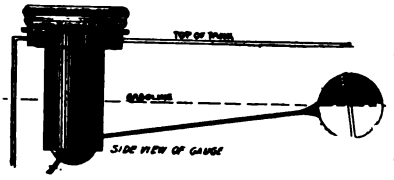

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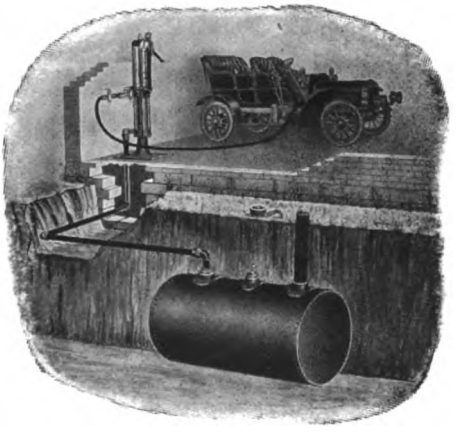

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TIRES (Pneumatic)

AJAX-Grieb Rubber Co., Broadway and 57th St., New York.

COMMONWEALTH Rubber Co., Reading, Mass.

CONTINENTAL Caoutchouc Co., 43 Warren St., N. Y. City (see page 171).

DIAMOND Rubber Co., Akron, O. (see page 209).

ELECTRIC Rubber Mfg. Co., Rutherford, N. J.

FISK Rubber Co., Chicopee Falls, Mass.

G & J Tire Co., 549 E. Georgia St., Indianapolis, Ind. (see page 17).

GAULIOS Tire Co., Broadway and 56th St., New York.

GOODRICH, B. F., Co., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

GOSHEN Rubber Works, Goshen, Ind.

HARBURG Tire Co., 234 W. 58th St., N. Y. City (see page 209).

HARTFORD Rubber Works Co., Hartford, Conn. (see page 161).

INDEPENDENT Tire & Rubber Co., Akron, O.

INTERNATIONAL Rubber Co., Milltown, N. J. (see page 207).

KOKOMO Rubber Co., Kokomo, Ind.

LAMBERJACK, E., & Co., Inc., 31-33 West 31st St., N. Y. City.

MORGAN & Wright, Detroit, Mich. (see page 199).

MOTZ Clincher Tire & Rubber Co. (The), Akron, O.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

REPUBLIC Rubber Co. (The), Youngstown, Ohio.

TRIDENT Tire Co., 1593 Broadway, N. Y. City.

TIRES (Solid)

ALDEN Rubber Co., Barberton, O.

BATAVIA Rubber Tire Co., Batavia, N. Y.

CALUMET Rubber Tire Co. (The), 43d and Wabansia Ave., Chicago, Ill.

CONSOLIDATED Rubber Tire Co., 40 Wall St., N. Y. City.

DIAMOND Rubber Co., Akron, O. (see page 209).

EMPIRE Rubber Mfg. Co., Trenton, N. J.

FIRESTONE Tire & Rubber Co., Miller St. and Sweitzer Ave., Akron, O.

GOODRICH, B. F., Co., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

HARTFORD Rubber Wks. Co., Hartford, Conn. (see page 161).

INDIA Rubber & Insulated Wire Co., Jonesboro, Ind.

INDIA Rubber Co., New Brunswick, N. J.

INTERNATIONAL Rubber Co., Milltown, N. J. (see page 207).

KOKOMO Rubber Co., Kokomo, Ind.

MAHONING Rubber Co., Youngstown, O.

MORGAN & Wright, Detroit, Mich. (see page 199).

NEW YORK Belting & Packing Co., 25 Park Pl., N. Y. City.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

R. & P. Traction Tread Tire & Tube Co., 1695 Broadway, New York City.

REPUBLIC Rubber Co. (The), Youngstown, Ohio.

ST. JOHN Rubber Tire Co., 116 Broad St., N. Y. City.

STEIN Double Cushion Tire Co., Akron, O.

SWEET Tire & Rubber Co. (The), Batavia, N. Y.

SWINEHART Clincher Tire & Rubber Co., Akron, O. (see page 203).

TIRE ALARMS

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (see page 177).

TIRE CASES

ALLEN Auto Specialty Co., 1931 Broadway, N. Y. City.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co. Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BURGIN Bros., Springfield, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

GILBERT Mfg. Co., New Haven, Conn. (see page 163).

HOPEWELL Bros., 42 Osborne St., Cambridge, Mass. (see page 163).

KIMBALL Tire Case Co., Council Bluffs, Ia.

LONDON Auto Supply Co., 1235 Michigan Ave., Chicago, Ill. (see page 39).

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MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

MYERS Auto Top Co., Dayton, O. (see page 135).

NATHAN Anklet Support Co. (The), 88 Reade St., N. Y. City.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127.

SEITZ, C., 207 E. 35th St., N. Y. City.

TEEL Mfg. Co., 132 Main St., Medford, Mass.

WARNER Pole & Top Co., 1655 Central Ave., Cincinnati, O.

WILEY, Wm. H. & Son Co., Box 30, Hartford, Conn. (see page 165).

TIRE FLUID

BIKO Mfg. Co., Hubbardson, Mass.

BUFFALO Specialty Co., 375 Ellicott St., Buffalo, N. Y.

CHICAGO Tire Filling Co., 122 S. Green St., Chicago, Ill.

GUMELASTIC Tire Co. (The), 920-922 Bolivar Rd., Cleveland, O.

JACKSON Tire Filling & Refilling Co., 190 W. Jackson Blvd., Chicago, Ill.

LINOLE Mfg. Co., Santa Clara, Cal.

LONGHURST, James S., Lynbrook, L. I., N. Y.

MOORE, Geo. P., Co., 305 Van Ness Ave., San Francisco, Cal.

NEWMASTIC Filling Co., N. Y. City.

N. Y. Anti-Puncture Tire Co., 132 W. 49th St., New York.

TIRE HOLDERS

ALLEN Auto. Specialty Co., 1931 Broadway, N. Y. City.

APPLIANCE Mfg. Co. (The), 70-86 W. Jackson Blvd., Chicago, Ill. (see page 189).

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (see page 177).

GILBERT Mfg. Co., New Haven, Conn. (see page opposite).

HILLMAN Plating Co., 446 Fremont St., Boston, Mass.

LONDON Auto Supply Co., 1235 Michigan Ave., Chicago (see page 39).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (see page 87).

RANDS Mfg. Co., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 175).

TIRE INFLATORS (Pump)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

ARTIZAN Brass Co., 204 Lincoln Park Blvd., Chicago, Ill.

AUTO Pump Co., Springville, N. Y.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BELL, D. M., Franklin and Michigan Sts., Chicago, Ill.

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BRIDGEPORT Brass Co., Bridgeport, Conn.

BROWN-Lipe Gear Co., Syracuse, N. Y. (see page 91).

CLEVELAND Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

COLONIAL Brass Co. (The), 316-318 Seneca St., Cleveland, O.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FERODOWILL Mfg. Co., St. Paul, Minn.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

HERZ & Co., 203-205 Lafayette St., New York.

IMPERIAL Brass Mfg. Co., 257 So. Jefferson St., Chicago, Ill.

JUDD & Leland, Clifton Springs, N. Y.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

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MILLER Mfg. Co., Peekskill, N. Y.

MOTOR Car Specialty Co., Fidelity Mutual Bldg., Philadelphia, Pa.

MOTOR Car Supply Co. (The), 425-427 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

POPE Mfg. Co., Hartford, Conn. (Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

SKINNER & Skinner, 1337 Michigan Ave., Chicago, Ill.

STEVENS & Co., 99 Chambers St., N. Y. City (Jobbers).

TILEY-Pratt Co. (The), Essex, Conn.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WRAY Pump & Register Co., Rochester, N. Y.

TIRE INFLATORS (Power Driven)

GARAGE Equipment Co., Milwaukee, Wis.

GLEASON-Peters Air Pump Co., Mercer and Houston Sts., New York, N. Y.

PACIFIC Tucking & Mfg. Co., 471-473 18th St., Brooklyn, N. Y.

ROTARY Triplex Pump Co., 126-128 South Jefferson St., Chicago, Ill.

SPACKE Machine Co. (The), F. W., Indianapolis, Ind. (see page 63).

VICTOR Electric Co., 51-55 Market St., Chicago, Ill.

TIRE INFLATORS (Tank)

AVERY Portable Lighting Co., Milwaukee, Wis.

PREST-O-LITE Co. (The), 1904 Broadway, N. Y. City (see page opposite).

STANDARD Carbonic Co., Cincinnati, O.

TIRE IRONS

ELLIOTT & Co., W. J., 185 Franklin St., Boston, Mass.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

TEEL Mfg. Co., Medford, Mass.

TRENTON Malleable Iron Co. (The), N. Y. Ave., Trenton, N. J.

UTILITY Co. (The), 332 Broadway, New York.

TIRE PATCHES

DIAMOND Rubber Co., Akron, O. (see page 209).

M. & M. Manufacturing Co. (The), Akron, O.

TRAVER Blow-out Patch Co., 1265 Broadway, New York (see page opposite).

TIRE PLUGS

COX & Spencer, Rahway, N. J.

DIAMOND Rubber Co., Akron, O. (see page 209).

GOODRICH, B. F., Co., Akron, O.

HUNTINGTON Automobile Co., Huntington, L. I., N. Y. (see page 9).

TINGLEY & Co., Chas. O., Rahway, N. J.

TIRE PROTECTORS

ADWEAR Auto Tire Sleeve Co., High and Washington Sts., North Attleboro, Mass. (see page 167).

ALLEN Auto Specialty Co., 1931 Broadway, N. Y. City.

AMERICAN Anti-Puncture Tire & Auto Co., 1693 Broadway, N. Y. City.

AMERICAN Tire Co., Owosso, Mich.

CHICAGO Rawhide Mfg. Co., 75 Ohio St., Chicago, Ill.

GILBERT Mfg. Co., New Haven, Conn. (see page 163).

HOWARD Mfg. Co., Attleboro, Mass.

HUMPHREYS, J., 1021 N. E. Payne Ave., Cleveland, O.

KIMBALL Tire Case Co., Council Bluffs, Ia.

LEATHER Tire Goods Co., Newton Upper Falls, Mass. (see page 31).

MESINGER Mfg. Co., H. & F., 1801-1803 First Ave., N. Y. City.

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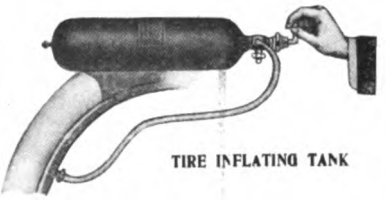
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SAMPSON Leather Tire Co., 1634-1642 Broadway, N. Y. City (see page opposite).

SLAMA Tire Protector Co., Humboldt, Neb.

TRAVER Blow-out Patch Co., 1265 Broadway, N. Y. City (see page 165).

TIRE REPAIR KITS

AUTO Goods Co., 60 State St., Boston, Mass.

CHANNON & Co., H., Market and Randolph Sts., Chicago, Ill. (see page 199).

DIAMOND Rubber Co., Akron, O. (see page 209).

GOODRICH, B. F., Co., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

HARTFORD Rubber Works Co., Hartford, Conn. (see page 161).

INDEPENDENT Tire & Rubber Co., Akron, O.

M. & M. Manufacturing Co., Akron, O.

RHODES Mfg. Co., 421 W. Bridge St., Grand Rapids, Mich.

UNION Mfg. Co., 506-508 Genesee St., Buffalo, N. Y.

TIRE SHOES

GRINARD Inserted Leather Auto Shoe Co., Buffalo, N. Y. (see page 201).

INNER Shoe Tire Co., 64 Monroe St., Grand Rapids, Mich.

MANNING Mfg. Co., Holyoke, Mass.

TIRE STRAPS

LEATHER Tire Goods Co., Newton Upper Falls, Mass. (see page 31).

TIRE TAPE

GOODYEAR Tire & Rubber Co., Akron, O.

MASSACHUSETTS Chemical Co., Walpole, Mass.

NATIONAL Cement & Rubber Mfg. Co., 3053 Monroe St., Toledo, O.

NATIONAL India Rubber Co., Bristol, R. I.

TIRE TOOLS

AUTO Improvement Co., 316 Hudson St., New York City.

BLANCHARD, A. W., 10 Clinton St., Brooklyn, N. Y.

GOODRICH, B. F., Co., Akron, O.

HANCOCK & Heller, 184-190 Water St., Binghamton, N. Y.

LONG & MANN Co. (The), 527 Central Bldg., Rochester, N. Y. (see page 181).

MAXWELL & Co., L. R., Cedar Rapids, Ia.

MORGAN & WRIGHT, Chicago, Ill. (see page 199).

POLSON, W. F., 22 West Utica St., Buffalo, N. Y.

RHODES Mfg. Co., Grand Rapids, Mich.

TIRE TREADS

ADWEAR Auto Tire Sleeve Co., High and Washington Sts., North Attleboro, Mass. (see page opposite).

BOSTON Tire Tread Co., 45 Stanhope St., Boston, Mass.

BUFFALO Rubber Mfg. Co., Sussex Ave. and Erie R. R., Buffalo, N. Y.

LEATHER Tire Goods Co., Newton Upper Falls, Mass. (see page 31).

M. & M. Manufacturing Co., Akron, O.

SAMPSON Leather Tire Co., 1634-1642 Broadway, N. Y. City. (see page opposite).

S. C. Fabric Tire Tread Co., 1900 Broadway, New York.

TIRE TUBES (Inner)

CONTINENTAL Rubber Wks., Erie, Pa.

ELECTRIC Rubber Mfg. Co., Rutherford, N. J.

EMPIRE Automobile Tire Co., Trenton, N. J.

PARKER, Stearns & Co., 228-220 South St., N. Y. City (see page 163).

TRENTON Rubber Mfg. Co., Trenton, N. J. (see page 19).

VICTOR Auto Tire Repair Co. (The), 220 Madison St., Passaic, N. J.

TOOLS

ARMSTRONG Bros. Tool Co., 104-124 N. Francisco Ave., Chicago, Ill.

AUTMO Cabinet Co. (The), Rochester, N. Y.

BRIDGEPORT Hardware Mfg. Co., 461-569 Iraniston Ave., Bridgeport, Conn.

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FRASSE Co. (The), 38 Cortlandt St., N. Y. City.

FRASSE, Peter A., & Co., 94 Fulton St., N. Y.

GOODELL-Pratt Co., Greenfield, Mass.

HAMMACHER, Schlemmer & Co., New York.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

NORTON & Jones Machine Tool Works (The), East Main St., Plainville, Conn.

PATTERSON, Gottfried & Hunter, Ltd., 146-150 Centre St., New York.

REPUBLIC Belting & Supply Co., Cleveland, Ohio.

SMITH & Heminway, 296 Broadway, New York.

SPRINGFIELD Drop Forging Co., Springfield, Mass.

TOWER & Lyon Co., 95 Chambers St., New York, N. Y.

UNIVERSAL Tool Co., 54 Taylor St., Springfield, Mass.

UTICA Drop Forge & Tool Co., 296 Broadway, New York, N. Y.

VANDERBEEK Tool Wks., Hartford, Conn.

WATERBURY Tool Co., Waterbury, Conn.

TOOL BAGS

BOYLE & Co., John, 112-114 Duane St., N. Y. City.

GILBERT Mfg. Co., New Haven, Conn. (see page 163).

PATTERSON, Gottfried & Hunter, Ltd., 146-150 Centre St., New York City.

WARREN Leather Goods Co., 80 Austin St., Worcester, Mass.

TOP-CLOTH (See Rubber Cloth) also Trimmings (Cloth and Carpet)

TOPS (Auto)

AMERICAN Top Co., Jackson, Mich.

ANDERSON & Co., F. W., 729 So. Broad St., Philadelphia, Pa. (see page 171).

AUTO Top Co. (The), Fort Wayne, Ind. (see page 171).

AUTOMOBILE Buggy Top Co. of America, Noxen, Pa.

AUTO Cape Top Co., 1465 Michigan Ave., Chicago, Ill.

AUTOMOBILE Top & Supply Co., Cleveland, O.

AUTOP & Tread Mfg. Co., Cleveland, O.

BALTIMORE Buggy Top Co., Baltimore, Md.

BARNDT-Johnston Auto Supply Co. (The), 422 Donaldson St., Columbus, O. (see page 37).

BAUER Bros., 937 W. 8th St., Cincinnati, O.

BEEBE, A. M., 441 Elm St., New Haven, Conn.

BLASIER Mfg. Co., M. E., 63 Columbia St., Utica, N. Y. (see page opposite).

BLISS, Chas. P., Denver, Colo.

BLUE Ribbon Horse & Carriage Co., 130-170 Cannon St., Bridgeport, Conn.

BRIDGEPORT Vehicle Co., Water and South Ave., Bridgeport, Conn.

BRIGGS Carriage Co., Amesbury, Mass.

BROC Carriage & Wagon Co., 1665-67 40th St., N. E., Cleveland, O.

BROWN Auto Top Co., Philadelphia, Pa.

BUOB & Scheu, 408-412 Court St., Cincinnati, O.

CHICAGO Coach & Carriage Co., 1223 Michigan Ave., Chicago, Ill.

COLEMAN Auto Top Co., Detroit, Mich.

COLLINS & Son, G. A., Akron, O.

CRAMER, Wm. F. (The), Dayton, O.

CRAY Bros., 1244 Ninth St., N. W., Cleveland, O.

CRESCENT Auto Top Co., 58 W. 43d St., N. Y. City.

DENNISTON, E. E., 184 W. Mohawk St., Buffalo, N. Y.

DETROIT Carriage Co., Detroit, Mich.

DETROIT Motor Car Supply Co., 1250 Jefferson Ave., Detroit, Mich.

DUANE & Co., W. J., New York City.

DUNHAM & Son, D. B., Rahway, N. J.

EMPIRE Gear & Top Co., 53 Mechanic St., Newark, N. J.

EMPIRE Gear & Top Co., 413 N. 22d St., Philadelphia, Pa.

EVERETT, B. F., Detroit, Mich.

FELLWOCK Automobile & Mfg. Co. (The), Evansville, Ind.

FICKLING & Co., Inc., 154 E. 57th St., New York City.

FISHER, A., 302-310 Fort St., W., Detroit, Mich.

HALLIDAY, C. A., 42 Cedar St., Oneida, N. Y.

HARDWARE Specialty Mfg. Co., 724 W. 8th St., Anderson, Ind.

HILL Manufacturing Co., 25-27 Fuller St., Buffalo, N. Y.

HUME Carriage Co., Amesbury, Mass. (see page 39).

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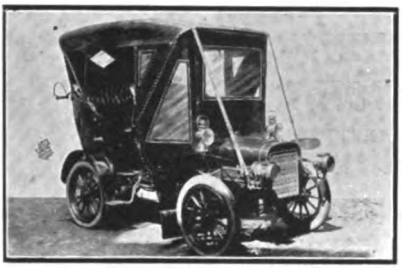

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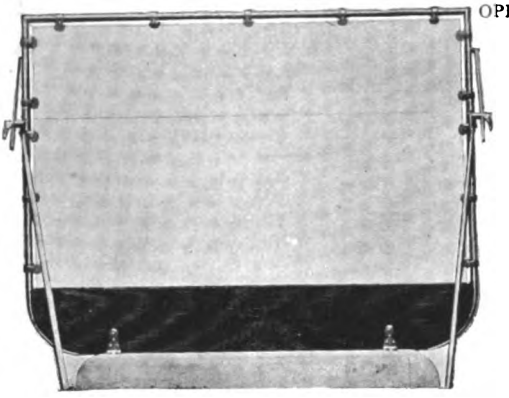

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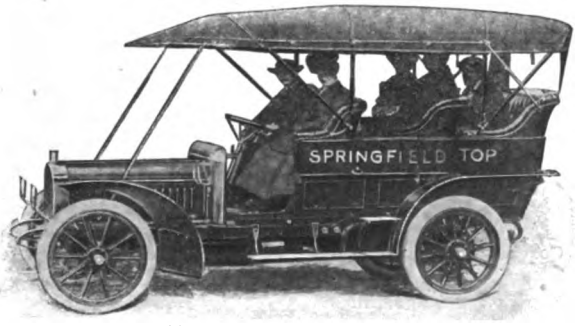

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INDIANAPOLIS Dash Co., Indianapolis, Ind.

KARBACH Automobile & Vehicle Co., Omaha, Neb.

KEYSTONE Wagon Works Co., Reading, Pa.

KIMBALL & Co., C. P., 315 Michigan Ave., Chicago, Ill. (see page 39).

KING Top Mfg. Co. (The), Dayton, O.

KRAMER & Co., Wm. F., Canal St., Dayton, Ohio.

KROH, C. Z., Mfg. Co., Toledo, O.

LARRIMORE Buggy Top Co., Baltimore, Md.

LIMOUSINE & Carriage Mfg. Co., 35th St. and Michigan Ave., Chicago, Ill.

LONDON Auto Supply Co. (The), 1235 Michigan Ave., Chicago, Ill. (see page 39).

LONGDIN-Brugger Co., Fond-du-lac, Wis.

LOUD, Fred A., Merrimac, Mass.

MANHATTAN Auto Top Co., 249 West 64th St., New York.

McCLELLAN, Chas. P., Fall River, Mass.

MECKEL, F. L., 77 E. 13th St., Chicago, Ill.

MEYER, C. G., Main and Ann Sts., Tiffin, O.

MICHIGAN Top Co., 17 Duffield St., Detroit, Mich.

MOTOR Top Co. of N. Y., 216 W. 50th St., New York.

MOUNT & Bros. J. W., Red Bank, N. J.

MURRAY & Co., P. A., Newton, Mass.

MYERS Auto Top Co. (The), Dayton, O. (see page 135).

NEUMEISTER, Fred P., Rockford, Ill.

NEWTON, W. H., & Son, 127 Elm St., Cortland, N. Y.

NEW York Carriage Top Co., 509 W. 30th St., N. Y. City.

NICHOLS & Co., D. P., 116-122 W. Brookline St., Boston, Mass.

O'NEILL-Ollier Co., 1532-34 Michigan Ave., Chicago, Ill.

PARIS Auto Top Co., 236 W. 41st St., New York.

PARSONS Buggy Top Co., Chicago, Ill.

PERFECTION Auto Top & Supply Co., 1253 Michigan Ave., Chicago, Ill.

RACINE Novelty Mfg. Co., 600 6th St., Racine, Wis.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

RECKARD Auto Top Co., 938 N. Illinois St., Indianapolis, Ind.

ROBBINS & Co., Irwin, Indianapolis, Ind.

ROBERTSON & Doll, Denver, Colo.

RUSSELL, H. J., 32 Exchange St., Worcester, Mass.

ST. LOUIS Buggy Top Co., 2117-19 North 9th St., St. Louis, Mo.

SCHUBERT Bros. Gear Co., 42-44 Cedar St., Oneida, N. Y.

SHELTER Top Co., 1240 North First St., St. Louis, Mo.

SHIELDS Carriage Co., Amesbury, Mass.

SNOW & Co., N. H., Binghamton, N. Y.

SPRAGUE Umbrella Co., Norwalk, O. (see page 67).

SPRINGFIELD Auto Top & Upholstering Co., 102 Dwight St., Springfield, Mass. (see page opposite).

SPRINGFIELD Metal Body Co., 387 Birnie Ave., Brightwood, Mass. (see page 169).

STONE & Sons, C., 167 Ogden St., Chicago, Ill.

STUDEBAKER Bros. Mfg. Co., 378 Wabash Ave., Chicago, Ill.

TEEL Mfg. Co., Medford, Mass.

TROY Carriage Sunshade Co., Troy, O.

UNITED STATES Dash & Fender Co., 147 E. 42d Street, N. Y. City.

VEHICLE Top & Supply Co., 900 Cass st., St. Louis, Mo. (see page 135).

VICTOR Factories (The), Broadway and 65th St., N. Y. City.

WARNER Pole & Top Co., 1655 Central Ave., Cincinnati, O.

WAUGH & Co., Chas., 856-864 Main St., Cambridge, Mass.

WEISS, Chas., 4725 Cottage Grove Ave., Chicago, Ill.

WOOD & Sons, Fred'k R., 219 W. 19th St., N. Y. City.

TOP FIXTURES

BOWERS Metal Stamping Co., 718 E. 11th St., New York.

BROWN & Co., S. N., Dayton, O.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 43).

CORTLAND Forging Co., Cortland, N. Y. (see page 43).

DRUEN, B. D., 71 Hamilton St., New Haven, Conn.

ENGLISH & Mersick Co., New Haven, Conn.

EVANS Mfg. Co., 118 N. Brookline St., Boston, Mass.

FICKLING & Co., Inc., 154 E. 57th St., New York.

HARPER Co., Walter J., 229-231 Mulberry St., Newark, N. J.

METAL Stamping Co., 243 West St., New York.

MURPHY Co., G. W. J., Merrimac, Mass.

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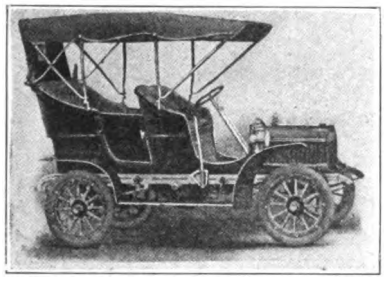

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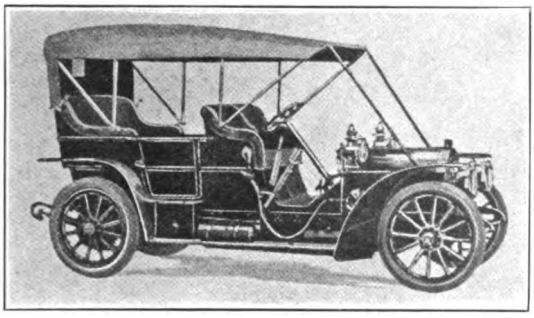

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NON-CORROSIVE Metal Co., Inc., Watertown, Mass.

PARRY & Co., A. N., Amesbury, Mass.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

RITTER Mfg. Co., Detroit, Mich.

SCHERER & Co., H., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 175).

SPRINGFIELD Auto Top & Upholstering Co., Springfield, Mass. (see page 171).

WING Co. (The) Charles, Amesbury, Mass.

SLATER, S., & Sons, 47 Worth St., N. Y. City.

TINGUE Mfg. Co., Seymour, Conn.

WATERLOO Woolen Mfg. Co., Waterloo, N. Y.

TRIMMINGS (Leather) (See Leather)

TRIMMINGS (Cloth and Carpet)

ADAMS, Wm. F., 339 B'way, N. Y. City.

BRIDGEPORT Coach Lace Co., 805 Wood Ave., Bridgeport, Conn.

CARR, F. S., 74 Pearl St., Boston, Mass. (see page 175).

CRANDALL, Stone & Co., Binghamton, N. Y.

DUSENBURY, Louis, 86 Worth St., N. Y. City.

EVERETT, B. F., Detroit, Mich.

GERHAB, Jacob, 158-164 No. 3d St., Philadelphia, Pa.

HALLIDAY, C. A., 42 Cedar St., Oneida, N. Y.

HARDT, Von Bernuth & Co., 477 Broome St., N. Y. City.

HODGMAN Rubber Co., 806 Broadway, N. Y. City.

HORSTMAN, Wm. H., Co., 5th and Cherry Sts., Philadelphia, Pa.

HUTCHINSON, W. R., & Co., 15 Caledonia Ave., Rochester, N. Y.

KROH, C. Z., Mfg. Co., Toledo, O.

LAIDLOW, Jr., Wm. R., 1771 Broadway, N. Y. City.

LANDERS Bros. Co., 445 10th St., Toledo, O.

MANUFACTURERS' Selling Co. (The), 1777 Broadway, N. Y. City.

MUTTY, L. J., 28 Summer St., Boston, Mass. (see page opposite).

NATIONAL India Rubber Co., Bristol, R. I.

NEW Haven Button Co., New Haven, Conn.

PANTASOTE Co. (The), 11 Broadway, N. Y. City (see page 203).

RARITAN Woolen Mills, 14 White St., N. Y. City.

ROEHM & Davison, Detroit, Mich.

ROUSE, J. G., & Co., 413 Arch St., Philadelphia, Pa.

ROY & Co., James, Watervleit, N. Y.

SCHOFIELD, Mason & Co., Fairhill and Cumberland Sts., Philadelphia, Pa.

TRIMMINGS (Metal)

AMERICAN Auto Brass Co. (The), 181 West Maple St., Columbus, O.

ANDERSON & Co., F. W., 729 So. Broad St., Philadelphia, Pa. (see page 171).

ATWOOD Mfg. Co., Amesbury, Mass.

BARLOW Mfg. Co., Holyoke, Mass.

BLAKESLEE Forging Co., Plantsville, Conn.

CLARK Novelty Co. (The), 380 W. Exchange St., Rochester, N. Y.

CLEVELAND Hardware Co., 1300 Lake St., Cleveland, O.

COLUMBUS Bolt Wks., 162 W. Randolph St., Columbus, O.

COOPS Co., C. W., 3 Appleton St., Boston, Mass. (see page 43).

CORTLAND Carriage Goods Co., Cortland, N. Y.

CORTLAND Forging Co., Cortland, N. Y. (see page 43).

COWLES, C., & Co., New Haven, Conn.

CRANDALL, Stone & Co., Binghamton, N. Y.

DOUGLAS & Lomason Co., 306 Grand River Ave., Detroit, Mich.

EBERHARD Mfg. Co., Cleveland, O.

ENGLISH & Mersick Co. (The), 70-74 Crown St., New Haven, Conn.

FORT Wayne Brass Foundry Co., 44 Jefferson Ave., Detroit, Mich.

FRANKLIN Moore Co. (The), Winsted, Conn.

GLOBE Machine & Stamping Co. (The), Cleveland, O. (see page 151).

HARPER Co., Walter J., 229-231 Mulberry St., Newark, N. J.

IMPERIAL Brass Mfg. Co., 257 S. Jefferson St., Chicago, Ill.

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (see page 69).

LEE Mfg. Co. (The), South Park, Port Huron, Mich.

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MURDOCK, Jas., Jr., & Co., 116 Opera Pl., Cincinnati, O.

MURPHY CO., G. W. J., Merrimac, Mass.

NEIDER Co., F. A. (The), Augusta, Ky. (see page 173).

NON-CORROSIVE Metal Co., Inc., Watertown, Mass.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

ROEHM & Davison, Detroit, Mich.

SCHERER, H., & Co., 280 Jefferson Ave., Detroit, Mich.

SMITH, Jos. N., & Co., 154-162 Fourth St., Detroit, Mich. (see page opposite).

TAYLOR Co., H. D., 101-105 Oak St., Buffalo, N. Y.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

VICTOR Metals Co., 29 Broadway, N. Y. City.

WHITE Mfg. Co., Cannon St., Bridgeport, Conn.

WING Co., Charles, Amesbury, Mass.

TRUNKS (Auto)

A-Z Co. (The), 527 West 56th St., N. Y. City.

BAILIE Basket Co., 85-87 Hudson St., Boston, Mass.

BOYLE & Co., John, 112-114 Duane St., N. Y. City.

FULLER Company, G. W., 182-184 Asylum St., Hartford, Conn.

MASON, John A., Newton, Mass.

SAGE'S Trunk Depot, Boston, Mass.

TEEL Mfg. Co., Medford, Mass.

W. W. Winship, 71 Summer St., Boston, Mass.

TRUNK RACKS

CONNECTICUT Steel & Wire Co., 308 Pearl St., Hartford, Conn.

FICKLING & Co., Inc., 154 E. 57th St., New York.

HART Mfg. Co., 370 Atlantic Ave., Boston, Mass.

MASON, John A., Newton, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (see page 87).

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SMITH, Charles A., Church Lane & P. & R. Ry., Germantown, Philadelphia, Pa.

SMITH Machine Co., H., 51 Godwin St., Paterson, N. J.

TEEL Mfg. Co., 132 Main St., Medford, Mass.

TUBING (Brass and Copper)

AMERICAN Tube Wks., 137 Milk St., Boston, Mass.

ANSONIA Brass & Copper Co., Ansonia, Conn.

BENEDICT & Burnham, Waterbury, Conn.

BRIDGEPORT Brass Co., Bridgeport, Conn.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (see page 133).

CHICAGO Brass Co., Kenosha, Wis.

CRAMP & Sons' Ship & Eng. Bldg. Co., Wm., Philadelphia, Pa.

DETROIT Copper & Brass Rolling Mills, Detroit, Mich.

FRENCH Mfg. Co., Waterbury, Conn.

HOLMES, Booth & Hayden Co. (The), Waterbury, Conn.

IVINS, Elwood Tube Works, Oak Lane Station, Philadelphia, Pa.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

LONG-Turney Mfg. Co., Rome, N. Y.

NEW Jersey Tube Co., Newark, N. J.

PATTERSON, Gotfried & Hunter, Ltd., 146-150 Centre St., New York, N. Y.

PREST-O-LITE Co. (The), 1904 Broadway, N. Y. City (see page 165).

RANDOLPH-Clowes Co., Waterbury, Conn.

ROME Brass & Copper Co., Rome, N. Y.

SIMMONS, John, Co., 104-110 Centre St., N. Y. City.

UNITED Wire & Supply Co., 109 Summer St., Providence, R. I.

WELLS & Co., A. H., Waterbury, Conn.

TUBING (Flexible)

ANGLO-American Flexible Metallic Tubing Co., New York, N. Y.

AUTOMOBILE Supply Mfg. Co., 139-147 Emerson Pl., Brooklyn, N. Y.

FLOWER & Co., Walter L., St. Louis, Mo.

MANHATTAN Screw & Lamp Co., 7th Ave. and 11th St., New York City.

SMITH, Albanus L. & Co., 1305 Arch St., Philadelphia, Pa. (Importer).

STEVENS & Co., 99 Chambers St., New York.

TUBING (Rubber)

DIAMOND Rubber Co., Akron, O. (see page).

PREST-O-LITE Co. (The), 1904 Broadway, N. Y. City (see page 165).

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IVINS, Elwood Tube Wks., Oak Lane Station, Philadelphia, Pa.

LAMINATED Tube Co., Columbus, O.

LENG'S Son & Co., John S., 33 Murray St., New York.

NATIONAL Tube Co., McKeesport, Pa.

PITTSBURG Seamless Tube Co., Beaver Falls, Pa.

SEAMLESS Tube Co. of America, Frick Bldg., Pittsburg, Pa.

SHELBY Steel Tube Co., 1819 Frick Bldg., Pittsburg Pa.

STANDARD Welding Co. (The), Cleveland, O.

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CONDON, Geo. W., 267 Halsey St., Newark, N. J.

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NILES-Bement-Pond Co., New York City.

NOVELTY & Repair Shop (The), Milford, Ohio.

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TURNBUCKLES (See Screw Machine Products)

TURN TABLES

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BICYCLE Step Ladder Co. (The), 63 Randolph St., Chicago, Ill.

ERNST'S Sons, C. F., 75 Lathrop St., Buffalo, N. Y.

FELLWOCK Auto & Mfg. Co., Evansville, Ind.

GIBBS-Brower Co., 150 Nassau St., N. Y. City.

LINK Belt Co, Chicago, Ill.

NORTH Penn. Iron Co. (The), Philadelphia, Pa.

PITLESS Turntable Co., Kansas City, Mo.

SKINNER & Skinner, 1337 Michigan Ave., Chicago, Ill.

SMITH Machine Co., H., 51 Godwin St., Paterson, N. J.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (see page 79).

WEBER Cycle & Supply Co., Colorado Springs, Colo.

UNIVERSAL JOINTS—See Joints (Flexible)

VALVES (Exhaust)

GRAY-Hawley Mfg. Co., 605 Fort St., E., Detroit, Mich.

MOTOR & Mfg. Works Co., Ithaca, N. Y. (see page 117).

POWELL Muffler & Timer Co., 42 La Fayette St., Utica, N. Y. (see page 117).

STANDARD Welding Co. (The), Cleveland, O.

VALVES (Gasoline, Lock)

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

VALVES (Safety)

AMERICAN Steam Gauge & Valve Mfg. Co., Jamaica Plains, Boston, Mass.

ARTIZAN Brass Co., 204 Lincoln Park Blvd., Chicago, Ill.

ASHTON Valve Co. (The), 271 Franklin St., Boston, Mass.

CROSBY Steam Gage & Valve Co., Boston, Mass.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

LONERGAN & Co., J. E., Philadelphia, Pa.

LUNKENHEIMER Co., Cincinnati, O.

PITTSBURG Gage & Supply Co., 309 Water St., Pittsburg, Pa.

SCHAEFFER & Budenberg, Foxboro, Mass.

SIMMONS Co., John, N. Y. City.

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

STAR Brass Mfg. Co., Boston, Mass.

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

WESTERN Tube Co., Kewanee, Ill.

WILLIAMS Valve Co. (The D. T.), 904-910 Broadway, Cincinnati, O.

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is superior to any supplementary spring control device made because it has qualities not possessed by others and especially one feature, to-wit:—

A graded control over the recoiling springs. This control increases in proportion to the effort on the springs. It is least at the initiative and the highest power is exerted at the final action where it is needed. This insures easy riding over smooth roads as well as rough roads.

Made to fit all kinds of cars. No oiling or adjusting necessary.

Price $60.00 per set of Four

Send for our Circular for fuller description.

THE BALDWIN CHAIN & MFG. CO.

offer the Trade for 1907 an entirely new line of Chains, re-designed on scientific lines, producing the lightest and strongest chains made. Correct in construction. Made from selected stock.

Send for samples and quotations.

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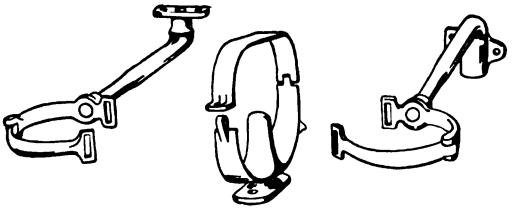

The arms are connected with the fixtures on the car by a bayonet attachment so that they can be removed without the aid of bolts or nuts.

The jaws are adjusted for one or two tires.

We furnish Plain foot piece with strap or locking foot piece for single or doubles tires. These are an unusual, substantial, well-made article

Double Tire Holders, locking device,	**$14.00**
With Plain foot piece - -	**$12.00**
Two arms without foot piece -	**$10.00**

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194 Chandler Street **WORCESTER, MASS.**

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H. D. Simmonds, 332 Broadway, New York. } **AGENTS**
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VALVES (Tire)

BOWN Machine Works, Battle Creek, Mich.

BUCK, L. K., Freehold, N. J.

HILTON Valve Co., Middleboro, Mass.

HOLMES & Bros., Robt., Danville, Ill.

MORGAN, B., Newport, R. I.

SCHRADER'S, A., Sons, 30-32 Rose St., N. Y. City.

SCHWAB, Louis, Newark, N. J.

SCOVILLE Mfg. Co., Waterbury, Conn.

STANDARD Valve Co., 163 Hawthorne Ave., Brooklyn, N. Y.

TIRE Safety-Device Co., 214 W. 124th St., N. Y. City.

VALVES (Throttle)

CHICAGO Auto. Mfg. Co., Chicago, Ill.

LOCKE Regulator Co., Salem, Mass.

LUNKENHEIMER Co., Cincinnati, O.

NOLTE Brass Co., Springfield, O.

POWELL, Wm., Co. (The), 2525-2531 Spring Grove Ave., Cincinnati, O.

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

SIMMONS, John, Co., 104-110 Centre St., N. Y. City.

VINCENT Valve Co. (The), Sandusky, O.

WILLIAMS Valve Co., The D. T., 904-910 Broadway, Cincinnati, O.

VALVE LIFTERS

AUTOMOBILE Specialty Co., 509 Willoughby Bldg., Chicago, Ill. (see page 157).

BEHEN-Faught Motor Car Equipment Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

VAPORIZERS

A. & J. Mfg. Co., Chicago, Ill.

BECKER, John, Hyde Park, Mass.

BRENNAN Mfg. Co., Syracuse, N. Y.

ECKEL, Andrew, 1080 3d Ave., Brooklyn, N. Y.

JAMES, Wm., 92 Liberty St., N. Y. City.

PELTON Gaso. Eng. Wks., Lyons, Ia.

VARNISHES

ACME White Lead & Color Wks., Detroit, Mich.

ADAMS & Elting Co., 155 W. Washington St., Chicago, Ill.

ARMITAGE & Co., John L., Newark, N. J.

BABCOCK Varnish Co., Boston, Mass.

BECKWITH, Chandler & Co., Newark, N. J.

BERRY Bros., Ltd., Detroit, Mich.

BILLINGS-Chapin Co., Cleveland, O.

BOSTON Varnish Co., Everett Sta., Boston, Mass.

BUFFALO Enamel & Stain Co., 70 W. Genesee St., Buffalo, N. Y.

CALMAN, Emil, 299 Pearl St., New York, N. Y.

CHASE, Roberts & Co., West Ave., Long Island City, N. Y.

CLEVELAND Varnish Co., Cleveland, O.

COLUMBUS Varnish Co. (The), Columbus, Ohio.

DETROIT White Lead Works, 532 Milwaukee Ave., Detroit, Mich.

DEVOE, F. W., & C. T. Raynolds Co., Fulton and William Sts., N. Y. City.

DITZLER Paint & Color Co., 14 Baltimore Ave., West, Detroit, Mich.

FELTON, Sibley & Co., 136-140 No. 14th St., Philadelphia, Pa.

FLOOD & Conklin Co., 136 Chestnut St., Newark, N. J.

GILLESPIE, Chas. H., & Sons, 125 Dey St., Jersey City, N. J.

GLIDDEN Varnish Co., Williamson Bldg., Cleveland, O.

HILDRETH Varnish Co., 32 B'way, N. Y. City.

LUCAS & Co., John, Philadelphia, Pa.

MASURY, John W., & Son, 44-50 Jay St., Brooklyn, N. Y.

MINETT Varnish Co., 129 Pearl St., N. Y. City.

MURPHY Varnish Co., Chestnut and McWhorter Sts., Newark, N. J.

NICE, Eugene E., 272-74 S. 2d St., Philadelphia, Pa.

ORIENTAL Varnish Co., 72 Midwood St., Brooklyn, N. Y.

PARROTT Varnish Co., Bridgeport, Conn.

PAYSON Varnish Co., 141st St. and Walnut Ave., New York City.

PERRIN Varnish Co., 1133 Broadway, N. Y.

RUBBER Paint Co., 154-156 W. Van Buren St., Chicago, Ill.

SCHRACK, C. & Co., 152 No. 4th St., Phila., Pa.

SHERWIN-Williams Co., Cleveland, O.

SMITH, Edward, & Co., 45 B'way, N. Y.

STANDARD Varnish Works, 29 Broadway, New York (see page opposite).

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Auto Car Varnishes

Are Superior to All Others

is because they are **specially made** to withstand the extremely hard usage to which Motor Cars are subjected.

They **produce better results, look better, wear better,** and **last longer** than any other line of Automobile Varnishes made.

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VALENTINE & Co., 257 Broadway, N. Y. City.

WATTS De Golyer Co. (The), 377 Illinois St., Chicago, Ill.

WESTERN Reserve Varnish Co., Marquette St., Cleveland, O.

WILLEY, C. A., Hunter's Point, New York.

VISES

EMMERT Mfg. Co., Waynesboro, Pa.

GRAHAM Mfg. Co. (The), Providence, R. I.

PITTSBURG Automatic Vise & Tool Co., Wabash Bldg., Pittsburg, Pa.

VOLTMETERS (See Ammeters and Voltmeters)

VULCANIZERS

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (see page 71).

AUTO Improvement Co., 316 Hudson St., New York City.

AUTO-TIRE Vulcanizing Co., Lowell, Mass.

CAIN, Frank, 202 4th Ave., Detroit, Mich.

CORP Bros., 40 Mathewson St., Providence, R. I.

FISK Rubber Co., Chicopee Falls, Mass.

GIBNEY & Bro., Jas. L., 211-13 N. Broad St., Philadelphia, Pa.

MAXSON Vulcanizing Works, 125 W. Main St., Rochester, N. Y.

NATIONAL Cement & Rubber Mfg. Co., 3053-59 Monroe St., Toledo, O.

RICE, Louis E., Cedar Falls, Ia.

SHALER Co., C. A., Waupun, Wis.

STITCH in Time Vulcanizer Co., Topeka, Kan. (see page opposite).

WISHART Machine Works, John, 63-65 South Canal St., Chicago, Ill. (see page opposite).

WASHERS

ARMSTRONG Cork Co., 23d St., and A. V. Ry., Pittsburg.

BOWEN Mfg. Co., Auburn, N. Y.

CLARK, A. N., & Son, Painville, Conn.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (see page 151).

HOFFELD, R., & Co., 61-63 Carroll St., Buffalo, N. Y.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

NATIONAL Lock Washer Co. (The), 65-89 Johnson St., Newark, N. J. (see page 119).

N. J. Car Spring & Rubber Co., Wayne and Brunswick Sts., Jersey City, N. J.

PICROME Hide Co., 1417 N. Salina St., Syracuse, N. Y.

POSITIVE Lock Washer Co., Newark, N. J. (see page 119).

SCHOONMAKER, A. O., 221 Fulton St., N. Y.

STIMPSON, E. B., & Son., 31 Spruce St., N. Y.

UPSON Bolt & Nut Co., Cleveland, O.

WOLVERINE Leather Goods Co., 59 E. Fort St., Detroit, Mich.

WASHERS (Felt)

BOOTH, N. E., 743-45 39th St., Brooklyn, N. Y. (see page 127).

BOWEN Mfg. Co., Auburn, N. Y.

BRAUNSDORF, Geo. W., 309 E. 43d St., N. Y. City.

WASHING MACHINERY

CONN. Supply Co., Hartford Life Ins. Bldg., Hartford, Conn.

IDEAL Carriage Washer Co., 62 Lenox St., Rochester, N. Y.

NICHOLSON Mfg. Co., H., 68 Dey St., N. Y.

RYAN & Long, 586 Oneida St., Appleton, Wis. (see page 157).

VEHICLE Specialty Co., 32 Union Pl., Hartford, Conn.

WATER ALARMS AND COLUMNS

JARVIS Engine & Machine Works, River and Spring Sts., Lansing, Mich.

KITTS Mfg. Co., 111-115 Water St. Oswego, N. Y.

LOCKE Regulator Co., Salem, Mass.

PITTSBURG Gauge & Supply Co., 309 Water St., Pittsburg, Pa.

RELIABLE Water Gauge Co., 1616 Pine St., St. Louis, Mo.

RELIANCE Gauge Column Co. (The), 45 E. Prospect St., Cleveland, O.

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

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STITCH-IN-TIME VULCANIZER

This Vulcanizer only weighs 1 1-2 pounds, and can be carried in the tool kit of an automobile. Repairs can be made by the roadside if necessary. Make a patch 3 x 2½".

Guaranteed to do all claimed for it or money refunded.

Anybody Can Use It.

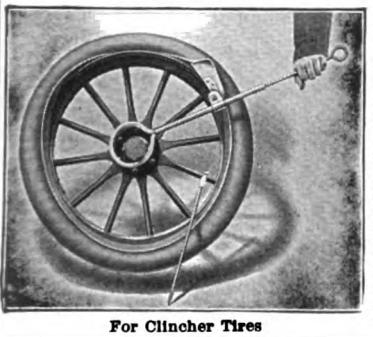
Blowouts, Sandboils, glass cuts or other damaged spots on outer casings: torn off stems, split or punctures to inner tubes vulcanized as good as new with our Vulcanizers. We want to send you circulars, and what others say.

"STITCH-IN-TIME" VULCANIZER CO. Topeka, Kan., U. S. A.

OUR TIRE ADJUSTERS WILL PUT ON OR TAKE OFF ANY TIRE WITHOUT EXERTION

The "Minute" clincher tire adjuster will actually take off or put on the **heaviest clincher tire in one minute**

The "Minute" Adjuster



For Clincher Tires

without injury to the shoe or inner tube and may be easily operated by a woman or child. The L & M ring tire adjuster is the only ring tire adjuster on the market. It consists of six tools which are slipped over the tire at intervals and by turning crank the tire is forced back from the ring all the way round, thus enabling you to put on or take off the ring with ease. **Write to-day for catalog and discount sheet.**

Patents applied for.

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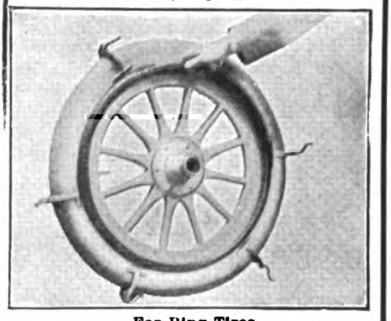
The "L & M" Adjuster



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If You Are a Tire Repair Man

looking for the very best outfit for turning out work **correctly** and **quickly,** which means **CHEAPLY,** you will want to see the **"EXCELSIOR"** equipment.

Note the counterweight on cover
One man operates instantly with ease

Our **Standard Steel Retreading Kettle,** 40" diameter, 36" deep, has demonstrated its superiority over any other type so conclusively that it is its own best salesman.

Furnished 42", 48", 54", or 60" deep if desired

For Inner Tubes

The "Excelsior" machine is the **only apparatus** that permits of quick adjustment and at the same time assures an **even cure.** Seven tires can be repaired at once.

Write us for descriptive and illustrated matter, showing **inner tube vulcanizer, vulcanizing boiler, air pump and air receiver.**

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KNOX, The Frank J. Co., Hartford, Conn.

WELDING (Electric)

STANDARD Welding Co. (The), Cleveland, O.

WHEELS (Sheet Steel)

FOUCH Disc Wheel Co., Inc., Tribune Bldg., Minneapolis, Minn.

TURNER & Fish Co., 19 Quincy St., Chicago, Ill. (see page opposite).

WHEELS (Tubular Steel)

BRYANT Steel Rim & Wheel Co., Columbus, Ohio.

MIDGLEY Mfg. Co., Columbus, O.

STANDARD Welding Co. (The), Cleveland, O.

WHEELS (Wire)

GARFORD Co. (The), Elyria, O.

JAMESVILLE Mfg. Co., Jamesville, N. Y.

MOTT Wheel Works (The), Pleasant St., Utica, N. Y.

PRUDDEN, W. K., & Co., Lansing, Mich.

RASTETTER, Louis & Son, Fort Wayne, Ind.

SMITH Co., A. O., Milwaukee, Wis.

WESTON-Mott Co., Flint, Mich.

WHEELS (Wood)

AMERICAN Roller Bearing Co., South Framington, Mass.

ARCHIBALD Wheel Co., Lawrence, Mass.

BIDDLE & Smart Co., Amesbury, Mass.

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (see page 119).

BUCKEYE Wheel Co., Galion, O.

CARR, Prescott & Co., Amesbury, Mass.

CITY Machine Co., 9 Orchard St., Detroit, Mich.

CRANE & McMahon, 18 South St., N. Y.

EAMES, A. M., & Co., So. Framingham, Mass.

FEDERAL Automobile Co., 1334 First National Bk. Bldg., Chicago, Ill.

HOOPES Bros. & Darlington, West Chester, Pa.

IMPERIAL Wheel Co., Flint, Mich. (see page opposite).

JAMESVILLE Mfg. Co., Jamesville, N. Y.

JONES, Phineas & Co., 301 Market St., Newark, N. J. (see page 119).

JONES, John E., 173 South St., Utica, N. Y.

LUVERNE Automobile Co., Luverne, Minn.

NATIONAL Wheel Co., Jackson, Mich.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (see page 41).

NEW Haven Carriage Co., New Haven, Conn.

OLDS Wagon Wks., Fort Wayne, Ind.

PRUDDEN, W. K., & Co., Lansing, Mich.

PULLMAN Wheel Co. (The), 37 Colony St., Meriden, Conn.

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y. (see page 189).

SCHWARZ Wheel Co., Philadelphia, Pa.

SENDELBACH Wheel Co., E. St. Louis, Ill.

STANDARD Wheel Co., Terre Haute, Ind.

TIMKEN Roller Bearing Axle Co., Canton, O.

WESTON-Mott Co., Flint, Mich.

WHEEL & Wood Bending Co. (The), 141 John St., Bridgeport, Conn.

WHITESIDE Wheel Co., Canal and W. 10th St., Indianapolis, Ind.

WHEEL TRUERS

DUDLEY, A. Mfg. Co., Menominee, Mich.

GARVIN Mach. Co., Spring and Varick Sts., N. Y. City.

WAGNER Cycle Co., 327 St. Peter St., St. Paul, Minn.

WIND SHIELDS (Glass)

BARNDT-Johnston Auto Supply Co. (The), 422 Donaldson St., Columbus, O. (see page 37).

BLASIER Mfg. Co., M. E., 63 Columbia St., Utica, N. Y. (see page 169).

BROC Carriage & Wagon Co., 1665-67 40th St., N. E., Cleveland, O.

CARTIER, Chapman & Co., Ludington, Mich.

CONOVER Motor Car Co. (The), Paterson, N. J.

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FELLWOCK Automobile & Mfg. Co., Evansville, Ind.

LIMOUSINE Carriage Mfg. Co., Chicago, Ill.

LONDON Auto Supply Co., 1235 Michigan Ave., Chicago, Ill. (see page 39).

MANHATTAN Auto Top Co., 249 W. 64th St., N. Y. City.

MEYER, Morris F., 65-69 E. Woodbridge St., Detroit, Mich (see page 135).

O'NEILL-Ollier Co., 1532-34 Michigan Ave., Chicago, Ill.

POLSON, W. F., 22 W. Utica St., Buffalo, N. Y.

ROSS & Kramer, 5607 S. Halsted St., Chicago, Ill.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (see page 175).

SMITH Machine Co., H., 51 Godwin St., Paterson, N. J.

SPRAGUE Umbrella Co., Norwalk, O. (see page 67).

STUDEBAKER Bros. Mfg. Co., South Bend Ind.

TEEL Mfg. Co., Medford, Mass.

WIRE (Insulated)

AMERICAN Electrical Works, Providence. R. I.

AMERICAN Steel & Wire Co., The Rookery. Chicago, Ill.

ATLANTIC Insulated Wire & Cable Co., New York.

BOURN Rubber Co., Providence, R. I.

CHICAGO Insulated Wire Co., 152 Lake St., Chicago, Ill.

CLARK Insulation Co. (The), 186 Freeport St., Boston, Mass.

EASTERN Electric Cable Co., 61-63 Hampshire St., Boston, Mass.

GEEN Electrical Mfg. Co., Inc., 180 E. Lake St., Chicago, Ill.

GENERAL Electric Co., Schenectady, N. Y.

HAZARD Mfg. Co., Wilkesbarre, Pa.

INDIA Rubber & Gutta Percha Insulating Co., N. Y. City.

INDIANA Rubber and Insulated Wire Co., Jonesboro, Ind.

MILLER, Norman Bruce, 1420 Chesnut St., Phila., Pa.

NATIONAL India Rubber Co., Bristol, R. I.

NEW YORK Insulated Wire Co., 114 Liberty St., N. Y. City.

OKONITE Co., 253 Broadway, N. Y. City.

PACKARD Electric Co., 399 North Ave., Warren, O. (see page opposite).

RUBAY, Leon, 136 W. 38th St., N. Y. City. (Importer).

SAFETY Insulated Wire & Cable Co., N. Y.

SIMPLEX Electrical Co., Boston, Mass.

STANDARD Underground Cable Co., Pittsburg, Pa.

WIRE TERMINALS

AMERICAN Electrical Novelty & Mfg. Co., N. Y. City.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

B. & B. Co., 97 Rockview Ave., Plainfield. N. J.

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BLISS-Chester Co., Providence, R. I.

BRIGGS, W. H., 424 Bedford Ave., Brooklyn. N. Y.

EASTERN Carbon Works, Jersey City, N. J.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

GEEN Electrical Mfg. Co., Inc., 180 E. Lake St., Chicago, Ill.

HERZ & Co., 203-205 Lafayette St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 87).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEVER-Miss Spark Plug Co., Lansing, Mich.

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

PITTSFIELD Spark Coil Co., P. O. Box 796, Pittsfield, Mass. (see page 141).

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

RAJAH Auto-Supply Co., 140 Washington St., N. Y. City.

SHAIN, Chas. D., 70 Murray St., N. Y. City.

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Reputation is behind every **Packard Product**

THIS NAME TO THE CAREFUL, DISCRIMINATING BUYER MEANS **QUALITY**

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HEAT, GREASE, OIL AND WATER PROOF

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STANDARD Battery Connection Co., 27 Copeland St., Roxbury, Mass.

TREGONING Electric Mfg. Co. (The), 224 High Ave., S. E., Cleveland, O.

WOOD BENDINGS

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J. (see page 15).

SHEPHERD & Son, H. G., New Haven, Conn.

TUCKER Wood Work Co. (The), Sidney, O.

WRENCHES

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers) (see page 71).

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers) (see page 193).

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 63).

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 29).

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo. (Dealers and Jobbers) (see page 95).

BISHOP Auto Supply Co., Olive and Walton Ave., St. Louis, Mo. (Dealers and Jobbers) (see page 107).

BILLINGS & Spencer Co., Russ and Lawrence Sts., Hartford, Conn.

BULLARD Automatic Wrench Co., Providence, R. I.

COES Wrench Co., Worcester, Mass.

DETROIT Wrench Co., Tolsma Bldg., 45 State St., Detroit, Mich.

DUDLY, A., Mfg. Co., Menominee, Mich.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers) (see page 23).

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (see page 75).

HALL'S Sons, Samuel, New York, N. Y.

HAMMOND Wrench Co., 26-30 Atlantic Ave., Boston, Mass.

HAWKEYE Wrench Co., Marshalltown, Ia.

HJORTH Wrench Co., Jamestown, N. Y.

JANNEY, Steinmetz & Co., Philadelphia, Pa. (see page 151).

MILLER Combination Tool Co., Syracuse, N. Y. (see page 45).

MOSSBERG, Frank, Co., Attleboro, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill (Dealers and Jobbers) (see page 87).

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers) (see page 137).

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers) (see page 41).

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers) (see page 17).

OFFSET Handle Wrench Co., 123 Lasalle St., Chicago, Ill.

PATTERSON, Gottfried & Hunter, Ltd., 14[illegible] Center St., New York.

PEDERSEN Mfg. Co., 644 First Ave., N. Y. City.

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers) (see page 131).

POST & Lester Co. (The), Hartford, Conn. (Dealers and Jobbers) (see page 127).

QUINCY, Manchester, Sargent Co., 8[illegible] Van Buren St., Chicago, Ill. (see page 193).

SMITH & Hemmingway, 296 Broadway, New York.

SPRINGFIELD Drop Forging Co., Springfield, Mass.

SYRACUSE Wrench Co., Franklin and Water Sts., Syracuse, N. Y. (see page opposite).

TOWER & Lyon Co., 95 Chambers St., New York, N. Y.

TRIMONT Mfg. Co., Roxbury, Mass.

TUDOR Mfg. Co., 98-100 Beacon St., Worcester, Mass.

WAKEFIELD, J. E., 89 Exchange St., Worcester, Mass.

WALWORTH Mfg. Co., Boston, Mass.

WARREN Axle & Tool Co., Warren, Pa.

WILLIAMS & Co., J. H., Brooklyn, N. Y.

WORCESTER Pressed Steel Co., 100 Beacon St., Worcester, Mass.

YORK Electric & Machine Co., 30 N. Pen St., York, Pa.

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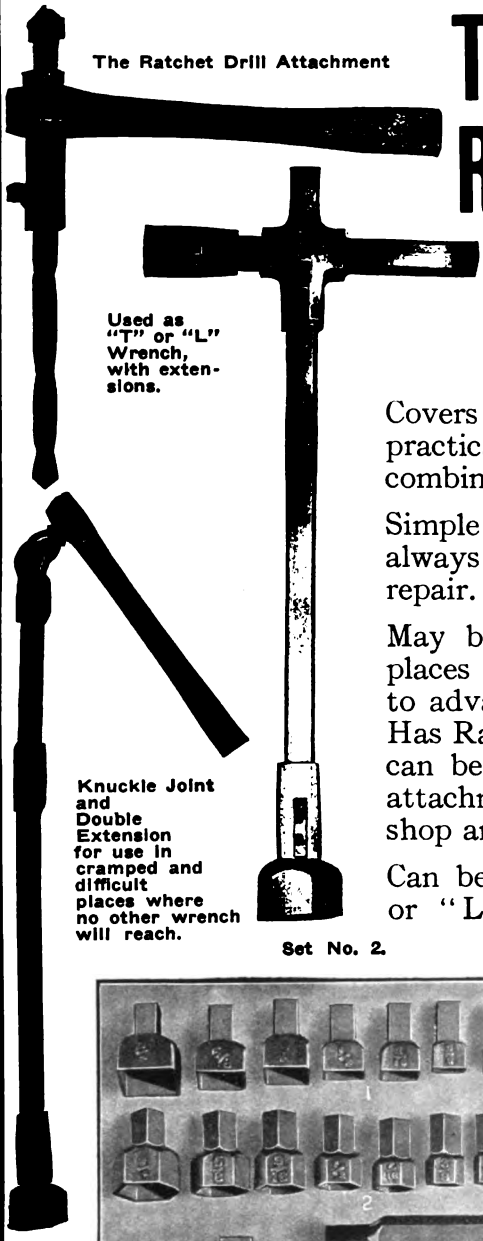

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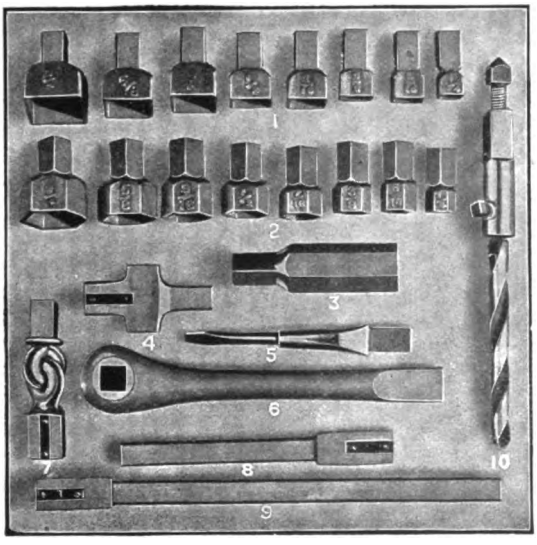
May be used in cramped and close places where you are unable to work to advantage with any other wrench. Has Ratchet and Drill Attachment so can be used as drill in emergency; an attachment of special advantage to shop and repair men.

Can be used with extensions as "T" or "L" wrench; knuckle joint and double extension for cramped places no other wrench can go.

Set No. 2.



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TABLES AND DATA FOR ENGINEERS

REFERENCE TABLES FOR INDICATED HORSEPOWER

It is often convenient to have a ready reference table, by the aid of which an immediate approximation to the horsepower of a motor can be made when the bore and stroke are known. Such a table has been prepared by Worby Beaumont, the well-known English engineer, who gave permission to the editor of *The Automobile Club Journal* in London to publish it. One table gives the ratings of engines with the cylinder dimensions in inches and fractions, and the other table gives the results with cylinders built to metric measurements. Of course, in a table of this sort, an arbitrary set of conditions as to revolutions, mean effective pressure and mechanical efficiency have to be assumed; those employed represent average practice and the table is not offered as a substitute for experimentation when the most accurate results are desired.

It will be noted from Table I that in a very small space the estimated indicated power of engines with bore and stroke dimensions varying from 2-in. bore and 2-in. stroke to 6-in. bore and 6 1-2-in. stroke is given. Similarly, in Table II, a similar series is given in metric measurement, covering sizes from 70 mm. bore and 70 mm. stroke to 150 mm. bore and 165 mm. stroke. In Table I there is a quarter of an inch difference of size of bore and stroke measurements between any two powers given, and in Table II a difference of 5 mm. In explanation of the tables, it will be seen that in column 1 the bore or cylinder diameter of the engine may be found, and in the columns to the right of this, commencing with the column headed 0, the power of the engine having that cylinder diameter and a stroke of the same dimension. Columns 3 to 10 in each table give the powers of engines of, for instance, the same bore, but having a stroke greater than the bore by the amount stated at the top of the column. For example, referring to Table I, an engine having a cylinder 4 inches in diameter and a stroke of 4 inches would develop, under conditions to be stated, 4.27 i.h.p., as shown in the column headed 0; that is, column 2. If, however, the engine has a cylinder bore of 4 inches and a stroke of 5 1-2 inches, then the power developed is as shown in column 8, 5.89 i.h.p.

Similarly, for example, referring to Table II, an engine having a bore and stroke of 100 mm. would give 4.09 i.h.p., and an engine with a cylinder 100 mm. diameter and 140 mm. stroke would give 5.72 i.h.p.

It will be observed that to each bore dimension in column 1, two horizontal lines are given. The first of these gives the calculated power at a speed of 750 revolutions per minute, and the second the power at 1,000 revolutions per minute. The figures for the higher speed are printed in italic type.

The powers given in the tables represent the calculated indicated power given by one cylinder, and when multi-cylinder engines are being considered, the power shown by the table must be multiplied by the number of cylinders to give the total power.

To determine the useful power or brake horsepower, the mechanical efficiency of the engine has to be considered. No general rule can be given for this, and it may vary from a little less than 80 per cent. of the indicated power to as much as 88 per cent. For the majority of four-cylinder engines of good design and in good condition, run at speeds not unsuited to their design, and for powers of not less than 20 b.h.p., the efficiency may be considered to be 85 per cent. within reasonably close limits of accuracy This figure is, however, merely suggestive, and it is necessary to be familiar with engine design and performances to correctly estimate the brake horsepower from the estimated indicated power of these small high-speed engines.

Very frequently an approximation to the calculated indicated power, or power developed in the cylinders, is all that is required to be known, and this may be taken direct from the tables, for the two named speeds; *i.e.*, 750 or 1,000 revolutions per minute. For other speeds the difference may be taken as arithmetically proportionate through a limited range, according to the type and design of the engine.

Tables on page 190.

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The "AMCO" BUMPER or FENDER

The only Bumper that will take a cornerwise jolt without breaking the bumper or springing your car. The **"AMCO"** therefore thoroughly protects your lamps and radiator frontwise and cornerwise, not only from the obstructions you might run into, but from the vehicles that might back into your car while it is standing idle by the curb.

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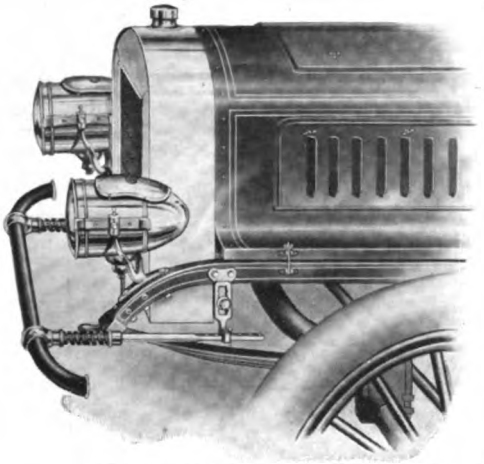

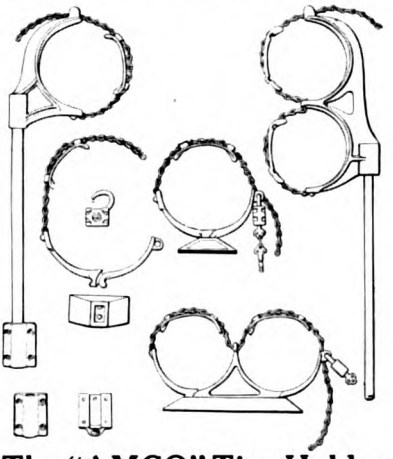

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In our heavier wheels we lose none of the artistic, still retaining sufficient strength in all parts. The mechanical value of our Patent Improved Artillery Hub stands out strong, for the ribs DO stiffen the flanges, DO prevent torsion, DO keep bolts from shearing, DO keep spokes always in alignment—facts that cannot be said of the smooth flange Hub.

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Horsepower Table I.—Cylinder Dimensions in Inches and Fractions.

Bore	0	¼	⅓	¾	1	¼	½	¾	2
2	0.54	0.60	0.67	0.74	0.81	0.88	0.94	1.01	1.08
	0.72	*0.80*	*0.89*	*0.98*	*1.08*	*1.17*	*1.25*	*1.35*	*1.44*
2¼	0.76	0.84	0.92	1.01	1.09	1.18	1.26	1.35	1.43
	1.01	*1.12*	*1.22*	*1.34*	*1.45*	*1.57*	*1.68*	*1.81*	*1.90*
2½	1.04	1.15	1.25	1.35	1.46	1.56	1.67	1.77	1.88
	1.38	*1.53*	*1.67*	*1.81*	*1.95*	*2.09*	*2.23*	*2.37*	*2.51*
2¾	1.39	1.51	1.64	1.77	1.89	2.02	2.14	2.27	2.40
	1.85	*2.02*	*2.19*	*2.36*	*2.53*	*2.70*	*2.87*	*3.04*	*3.20*
3	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	3.00
	2.40	*2.60*	*2.80*	*3.00*	*3.21*	*3.40*	*3.61*	*3.81*	*4.00*
3¼	2.30	2.47	2.65	2.82	3.00	3.18	3.36	3.53	3.70
	3.06	*3.28*	*3.52*	*3.76*	*3.99*	*4.22*	*4.45*	*4.70*	*4.92*
3½	2.86	3.06	3.27	3.48	3.68	3.88	4.09	4.30	4.50
	3.81	*4.09*	*4.36*	*4.63*	*4.90*	*5.18*	*5.45*	*5.72*	*6.00*
3¾	3.53	3.76	4.00	4.35	4.47	4.71	4.95	5.18	5.41
	4.71	*5.02*	*5.34*	*5.65*	*5.97*	*6.28*	*6.60*	*6.91*	*7.23*
4	4.27	4.65	4.81	5.08	5.35	5.61	5.89	6.15	6.41
	5.71	*6.06*	*6.42*	*6.78*	*7.13*	*7.50*	*7.85*	*8.20*	*8.55*
4¼	5.13	5.44	5.74	6.04	6.34	6.64	6.95	7.25	7.55
	6.84	*7.24*	*7.64*	*8.05*	*8.45*	*8.85*	*9.25*	*9.66*	*10.06*
4½	6.19	6.53	6.87	7.22	7.56	7.90	8.25	8.59	8.93
	8.25	*8.68*	*9.16*	*9.62*	*10.08*	*10.54*	*10.96*	*11.41*	*11.89*
4¾	7.18	7.55	7.94	8.31	8.70	9.07	9.45	9.82	.....
	9.57	*10.07*	*10.57*	*11.09*	*11.58*	*12.08*	*12.59*	*13.09*	.....
5	8.38	8.80	9.22	9.65	10.05	10.46	10.90	.....	.....
	11.16	*11.72*	*12.28*	*12.84*	*13.40*	*13.95*	*14.50*	.....	.....
5¼	9.70	10.16	10.62	11.09	11.54	12.00	.....	.....	.....
	12.92	*13.54*	*14.15*	*14.76*	*15.40*	*16.00*	.....	.....	.....
5½	11.12	11.65	12.15	12.66	13.15	.....	.....	.....	.....
	14.84	*15.51*	*16.20*	*16.86*	*17.54*	.....	.....	.....	.....
5¾	12.71	13.27	13.82	14.38	.....	.....	.....	.....	.....
	16.96	*17.70*	*18.42*	*19.19*	.....	.....	.....	.....	.....
6	14.45	15.05	15.65	.....	.....	.....	.....	.....	.....
	19.25	*20.05*	*20.85*	.....	.....	.....	.....	.....	.....

Horsepower Table II.—Cylinder Dimensions in Millimeters (Metric System).

Bore	0	5	10	15	20	25	[illegible]	[illegible]	[illegible]
70	1.40	1.50	1.59	1.69	1.80	1.89	[illegible]	[illegible]	[illegible]
	1.87	*2.00*	*2.13*	*2.26*	*2.40*	*2.53*	[illegible]	[illegible]	[illegible]
75	1.72	1.84	1.95	2.07	2.18	2.29	[illegible]	[illegible]	[illegible]
	2.30	*2.45*	*2.60*	*2.76*	*2.91*	*3.06*	[illegible]	[illegible]	[illegible]
80	2.09	2.23	2.35	2.49	2.62	2.76	[illegible]	[illegible]	[illegible]
	2.79	*2.97*	*3.14*	*3.32*	*3.49*	*3.67*	[illegible]	[illegible]	[illegible]
85	2.43	2.65	2.80	2.95	3.09	3.24	[illegible]	[illegible]	[illegible]
	3.34	*3.54*	*3.73*	*3.93*	*4.12*	*4.32*	[illegible]	[illegible]	[illegible]
90	2.97	3.14	3.30	3.46	3.64	3.80	3.96	[illegible]	[illegible]
	3.96	*4.18*	*4.40*	*4.62*	*4.85*	*5.06*	*5.28*	*5.50*	[illegible]
95	3.50	3.68	3.87	4.05	4.24	4.42	4.61	4.80	[illegible]
	4.67	*4.91*	*5.16*	*5.40*	*5.65*	*5.90*	*6.15*	*6.40*	[illegible]
100	4.09	4.29	4.49	4.70	4.90	5.11	5.30	5.51	5.72
	5.45	*5.71*	*5.99*	*6.26*	*6.53*	*6.81*	*7.07*	*7.35*	*7.62*
105	4.73	4.95	5.17	5.40	5.63	5.85	6.08	6.30	6.53
	6.30	*6.60*	*6.90*	*7.20*	*7.50*	*7.80*	*8.10*	*8.40*	*8.70*
110	5.43	5.69	5.93	6.19	6.44	6.68	6.96	7.16	7.42
	7.23	*7.58*	*7.90*	*8.25*	*8.57*	*8.90*	*9.23*	*9.55*	*9.90*
115	6.22	6.48	6.77	7.03	7.30	7.56	7.85	8.11	8.37
	8.30	*8.65*	*9.02*	*9.38*	*9.74*	*10.01*	*10.46*	*10.81*	*11.18*
120	7.07	7.37	7.66	7.96	8.25	8.53	8.84	9.13	9.41
	9.42	*9.82*	*10.21*	*10.61*	*11.00*	*11.39*	*11.79*	*12.18*	*12.57*
125	7.97	8.30	8.63	8.94	9.25	9.57	9.89	10.21	10.54
	10.64	*11.06*	*11.50*	*11.91*	*12.34*	*12.76*	*13.20*	*13.61*	*14.04*
130	8.95	9.30	9.65	9.99	10.34	10.70	11.01	11.38	.....
	11.94	*12.40*	*12.86*	*13.31*	*13.79*	*14.25*	*14.70*	*15.16*	.....
135	10.08	10.44	10.80	11.18	11.56	11.92	12.30	.....	.....
	13.41	*13.91*	*14.40*	*14.90*	*15.41*	*15.90*	*16.40*	.....	.....
140	11.22	11.65	12.04	12.44	12.84	13.25	.....	.....	.....
	14.99	*15.51*	*16.05*	*16.60*	*17.12*	*17.68*	.....	.....	.....
145	12.52	12.98	13.41	13.82	14.25	.....	.....	.....	.....
	16.70	*17.30*	*17.88*	*18.42*	*19.00*	.....	.....	.....	.....
150	13.81	14.26	14.72	15.40	.....	.....	.....	.....	.....
	18.41	*19.01*	*19.64*	*20.23*	.....	.....	.....	.....	.....

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GRADE		Equal to Angle of	Rise or Fall in One Mile Feet
Per Cent	Units		
20	1 in 5	11° 19′	1,056
17	1 " 6	9° 26′	880
14	1 " 7	8° 09′	754
12.5	1 " 8	7° 08′	635
11	1 " 9	6° 17′	586
10	1 " 10	5° 43′	528
9	1 " 11	5° 11′	480
8	1 " 12	4° 46′	440
7.75	1 " 13	4° 24′	406
7	1 " 14	4° 05′	337
6.5	1 " 15	3° 49′	352
6.25	1 " 16	3° 35′	330
6	1 " 17	3° 22′	310
5.5	1 " 18	3° 11′	293
5	1 " 19	3° 00′	277
5	1 " 20	2° 52′	204
4	1 " 25	2° 18′	218
3.3	1 " 30	1° 55′	155
2.8	1 " 35	1° 38′	151
2.5	1 " 40	1° 26′	132

HILL-CLIMBING FORMULAS (WORBY BEAUMONT)

W = Weight of car and load in pounds.
w = Weight of car and load in tons.
H = Total ascent in feet.
L = Length of hill in feet.
R = Road resistance in pounds per ton weight of car and load
r = Air resistance in pounds = $V^2 A$ 0.0017.
V = Velocity of car in feet per second.
A = Area of car in square feet presented to air resistance.
T = Time occupied in ascent in seconds.
E = Efficiency of transmission of power from engine to road wheels
$H.P.$ = Effective horse power of engine.
p = Power given off at road wheels or work done in ascending hill.
S = Speed of ascent in miles per hour.

Then if P = Mean effective cylinder pressure
L = Length of stroke in feet.
A = Area of piston in square inches.
N = Number of useful or firing strokes per minute,

the brake horse-power of petrol or steam engines, having a mechanical efficiency of E, is

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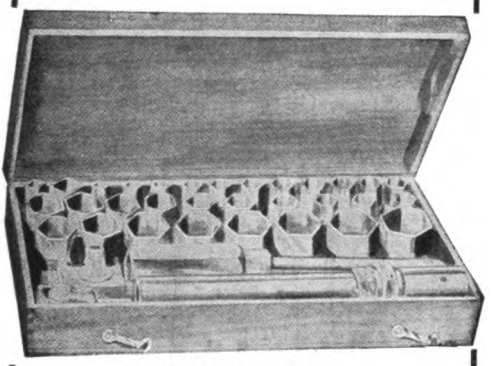

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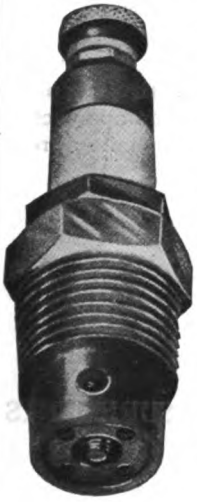

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For compound steam engines the number of useful working strokes are those occurring in the low-pressure cylinder, and the mean effective pressure in the high-pressure cylinder or cylinders is referred to the area of the low-pressure cylinder.

The power given off at the road wheels during the ascent of the hill is

$$p = \frac{HW + (R\,w + r)\,L}{T\ 550}$$

and the brake horsepower required at the engine with a selected value of E is

$$HP = \frac{HW + (R\,w + r)\,L}{TE\ 550}$$

With the other conditions known, the efficiency may be found from

$$E = \frac{HW + (R\,w + r)\,L}{HP.\ T\ 550}$$

the speed of the ascent in miles per hour from

$$S = \frac{L}{\dfrac{HWL + (R\,w + r)}{HP.\ E\ 550}\,L} \times 1.466$$

and the time occupied in the ascent from

$$T = \frac{HW + (R\,w + r)\,L}{HP.\ E\ 550}$$

Unless the probable speed of the car is high, or the wind velocity such that the pressure upon the surface of the car presented to air resistance opposing motion approaches that due to the speed of the car through still air, then the quantity r may be omitted from the foregoing expressions without introducing more than slight error.

SPEED FORMULA

To reduce A miles in B seconds to miles per hour,

$$A \times \frac{3600}{B} = \text{miles per hour.}$$

SPEED EQUIVALENTS IN AMERICAN AND FRENCH MEASUREMENTS

1 mile per hour	= 88	ft. per minute.
	= 1.46	ft. per second.
	= 27.8	metres per minute.
	= 0.463	metre per second.
1 km. per hour	= 0.624	miles per hour.
	= 54.9	ft. per minute.
	= 0.914	metre per second.

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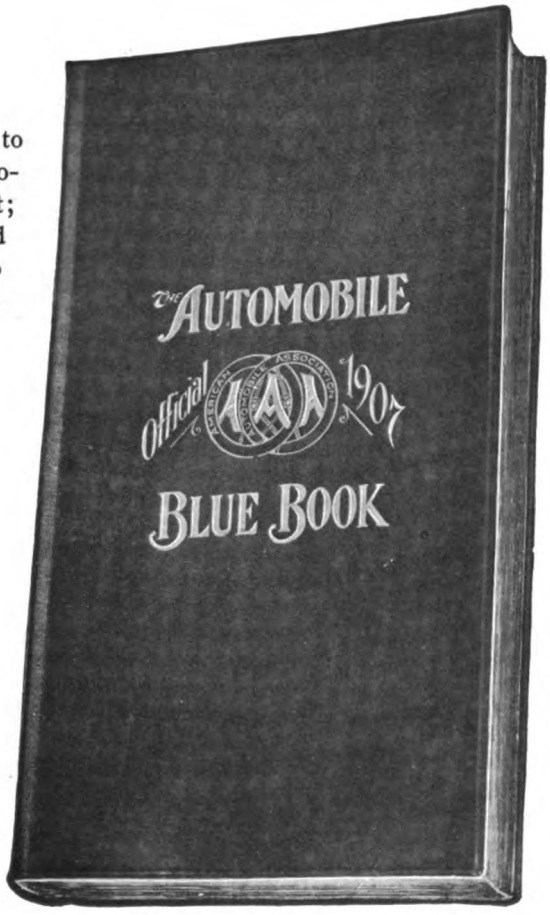

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THE CLASS JOURNAL CO. FLATIRON BLDG. NEW YORK CITY

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RATE OF SPEED IN MILES PER HOUR FOR ELAPSED TIME OVER THE MEASURED MILE FROM ONE TO THREE MINUTES

Time Over Measured Mile		Rate of Speed in Miles per Hour	Time Over Measured Mile		Rate of Speed in Miles per Hour	Time Over Measured Mile		Rate of Speed in Miles per Hour
Min.	*Sec.*		*Min.*	*Sec.*		*Min.*	*Sec*	
1	0	60.00	1	27	41.38	1	54	31.58
1	1	59.00	1	28	40.91	1	55	31.30
1	2	58.06	1	29	40.45	1	56	31.03
1	3	57.14	1	30	40.00	1	57	30.77
1	4	56.25	1	31	39.56	1	58	30.50
1	5	55.38	1	32	39.13	1	59	30.25
1	6	54.54	1	33	38.71	2	0	30.00
1	7	53.73	1	34	38.29	2	3	29.26
1	8	52.94	1	35	37.89	2	6	28.57
1	9	52.17	1	36	37.50	2	9	27.90
1	10	51.42	1	37	37.11	2	12	27.27
1	11	50.70	1	38	36.73	2	15	26.66
1	12	50.00	1	39	36.36	2	18	26.08
1	13	49.31	1	40	36.00	2	21	25.53
1	14	48.65	1	41	35.64	2	24	25.00
1	15	48.00	1	42	35.29	2	27	24.49
1	16	47.37	1	43	34.95	2	30	24.00
1	17	46.75	1	44	34.61	2	33	23.53
1	18	46.15	1	45	34.28	2	36	23.07
1	19	45.57	1	46	33.96	2	39	22.64
1	20	45.00	1	47	33.64	2	42	22.22
1	21	44.44	1	48	33.33	2	45	21.81
1	22	43.90	1	49	33.03	2	48	21.42
1	23	43.37	1	50	32.72	2	51	21.05
1	24	42.85	1	51	32.43	2	54	20.69
1	25	42.35	1	52	32.14	3	0	20.00
1	26	41.86	1	53	31.86	..	..	.....

REVOLUTIONS PER MINUTE OF AUTO ROAD WEEELS AT DIFFERENT RATES OF SPEED

Diameter of Wheel	MILES PER HOUR									
	2	4	6	8	10	15	20	25	30	40
Inches										
24.....	28	56	84	112	140	210	280	350	420	560
26.....	26	52	78	103	129	194	258	323	388	517
28.....	24	48	72	96	120	180	240	300	360	480
30.....	22	45	67	90	112	168	224	280	336	448
33.....	20	41	61	82	102	153	204	255	306	408
36.....	19	37	56	75	93	140	187	234	280	374
42.....	16	32	48	64	80	120	160	200	240	320

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NATIONAL COILS

For 1907

have proved themselves winners and equal to all tests given them. If you want a coil that never breaks down in the windings and that has the highest possible speed, look into the merits of our goods.

NATIONAL COIL CO.,

Lansing, Mich., U. S. A.

HIGHEST TYPE IGNITION BATTERY MADE

COLUMBIA IGNITER

USED BY AUTO OWNERS IN PREFERENCE TO ALL OTHERS

NATIONAL CARBON COMPANY CLEVELAND, O.

Heinze Four Cylinder Auto Spark Coil

We are the Largest Coil Manufacturers in the Country, making from one to four cylinder dash board coils, and all kinds of high and low tension coils.

Our coil gives a fat spark of great frequency, never skips. Do not settle on any coil until you have tried ours.

Our prices are reasonable.

Send for catalogue.

Heinze Electric Company LOWELL, MASS.

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STRIKING ENERGY OF AUTOMOBILES (DURAND)

Let W = weight of automobile, measured in pounds.
F = average force over the distance required to bring automobile to rest, measured in pounds.
L = distance over which force is exerted to bring automobile to rest, measured in feet.
V = velocity in feet per second,

Then Energy $= \dfrac{W V^2}{64.4}$ in foot pounds,

$F L$ = measure of destructive work done in stopping the machine.

Then $F L = \dfrac{W V^2}{64.4}$

$$F = \frac{W V^2}{64.4 L}$$

$$L = \frac{W V^2}{64.4 F}$$

Or, otherwise and more generally, let E be any fraction or amount of energy which is lost in overcoming an average resistance F over a distance L.
Then:

$$E = F L$$
$$F = E \div L$$
$$L = E \div F$$

In the actual case of automobile collision, F, as has been carefully noted, is merely a distance average of the force developed. It means simply that there will be as much destructive work done as would correspond to the exhibition of a force F over a distance L. Actually, the destructive work will be made up of parts, each one of which may consist of a very much larger force, acting through such smaller distance as may be needed for the rupture of the part in question.

TRANSMISSION EFFICIENCY OF DIFFERENT TYPES OF MECHANISM (WORBY BEAUMONT)

Source of Loss of Power	Amount of Loss Per Cent.	Efficiency Per Cen .
		100
When driving direct:		
One chain	3.0	...
One and one-half pairs of bearings	7.5	89.5
With epicylic speed gear in operation, add	15.0	74.5
When driving direct:		
One set of gear	5.0	...
Two pairs of bearings	10.0	....
Partially active bearings	3.0	82 0
With change-speed reduction gear in operation, add	12.0	70.0

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MORGAN & WRIGHT TIRES

stand pre-eminent among auto tires

in the quality and quantity of service given for every dollar of cost

They positively reduce the cost of car maintenance

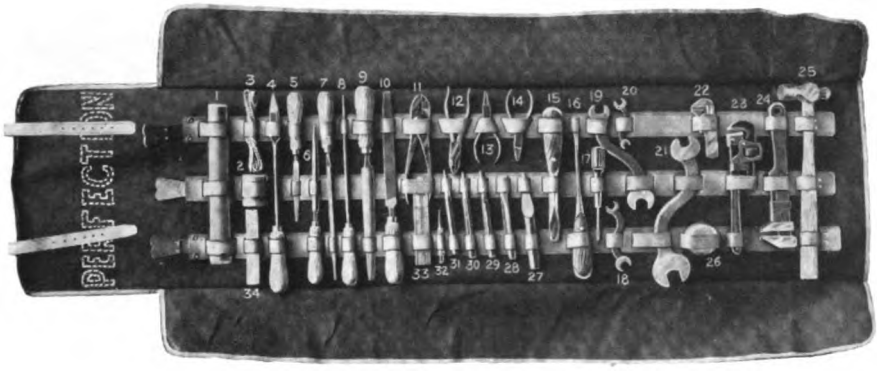
Clincher—Dunlop—Bailey "Won't Slip" Tread.

MORGAN & WRIGHT, Detroit, Mich.

DETROIT RUBBER WORKS

New York	Boston	Cleveland	Detroit	Atlanta
Kansas City	Los Angeles	Portland	Syracuse	Philadelphia
Dayton	Minneapolis	St. Louis	Denver	San Francisco

PERFECTION



IN AUTO REPAIR KITS

The Largest Line — Superior Tools — Practical Kits
Immediate Shipments — Special Kits to Order.

DEALERS

Get our proposition

H. Channon Company, Chicago

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Source of Loss of Power	Amount of Loss Per Cent	Efficiency Per Cent.
		100
One set of gear	5.0	....
Three pairs of bearings	15.0	....
Equivalent of two chains	6.0	74.0
Two sets of gear	10.0	....
Four pairs of bearings	20.0	70.0
Two sets of gear	10.0	....
Five pairs of bearings	25.0	....
Equivalent of one chain	3.0	62.0
Equivalent of three sets of gear	15.0	....
Five pairs of bearings	25.0	60.0

TRACTION EFFORT ON VARIOUS SURFACES (NORRIS)

On rails or plates	5.16 pounds per ton
Asphalt or hardwood	12.24 " " "
Macadam	30.60 " " "
Loose gravel	140 to 200 " " "
Sand	400 " " "
With different tires (comparatively)	
Iron	60 " " "
Solid Rubber	60 " " "
Pneumatic	45 " " "

POWER CONSUMED IN MOVING A PLANE SURFACE AT DIFFERENT VELOCITIES IN THE OPEN AIR (KEMPE)

SPEED IN		Horse-power per Square foot of Effective Surface	SPEED IN		Horse-power per Square foot of Effective Surface
Miles per Hour	Feet per Minute		Miles per Hour	Feet per Minute	
10	880	0.013	50	4,400	1.64
15	1,320	0.044	75	6,600	5.54
20	1,760	0.105	100	8,800	13.13
25	2,200	0.205	150	13,200	44.29
30	2,640	0.354	200	17,600	105.00

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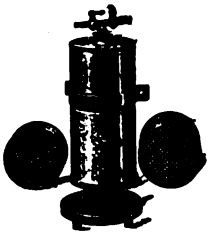
Columbia

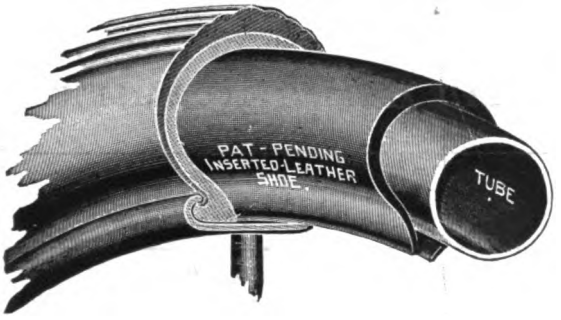
Auto Lamps and Generators

¶ Our Generators are so good that they never come back. Our Lamps are just the same—both strictly high grade and satisfactory. 27 Varieties. Auto Supplies.



Write for prices and catalogue

HINE-WATT MANUFACTURING CO.
60 Wabash Avenue
Chicago, Ill.



The Grinard
Inserted Leather
Auto Shoe

No More Blow Outs

See That Inserted Leather Shoe.

This Shoe is absolutely Blow Out Proof.

Made of Pure Sole Leather on'y. We guarantee that there is no Fibre or Canvas in this shoe. It is made over a last the same as the shoe you wear on your foot. Each size tire has a last to conform with it, and each leather shoe fits the tire exact. Made in all tire sizes.

Try One In An Old Tire That You Are Casting Away
It Will Run Another Season At Least
Full Set Costs Less Than One New Tire. Interested?

Write Now for Booklet
NO MORE "BLOW OUTS"

Grinard Inserted Leather Shoe Co.

Factory
Olean, N. Y.

CHAS. W. ELLIS, Sales Mgr.
Buffalo, N. Y., U. S. A.

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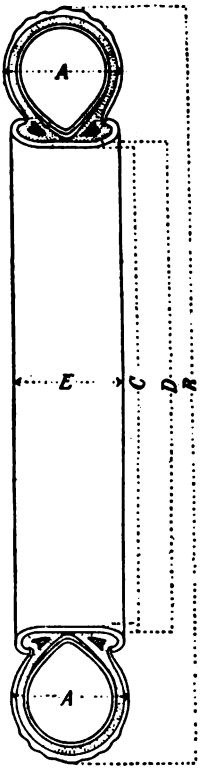
CLINCHER TIRE AND RIM DIMENSIONS



A Inches	B Inches	C Inches	D Inches	E Inches
2 1/2	26	18 3/4	19	1 3/8
3	26	19 3/4	20	1 3/8
2 1/2 and 3	28	21 3/4	22	1 3/8
2 1/2 and 3	30	23 3/4	24	1 3/8
3	32	25 3/4	26	1 3/8
3	34	27 3/4	28	1 3/8
3	36	29 3/4	30	1 3/8
3 1/2	28	20 11/16	21	1 3/8
3 1/2	30	22 11/16	23	1 1/2
3 1/2	32	24 11/16	25	1 1/2
3 1/2	34	26 11/16	27	1 1/2
3 1/2	36	28 11/16	29	1 1/2
4	30	21 11/16	22	2
4	32	23 11/16	24	2
4	34	25 11/16	26	2
4	36	27 11/16	28	2
4 1/2	32	22 11/16	23	2 1/4
4 1/2	34	24 11/16	25	2 1/4
4 1/2	36	26 11/16	27	2 1/4

METRIC TIRES AND THEIR AMERICAN EQUIVALENTS

Metric Sizes	Approximate Size in Inches
650 x 65	26 x 2 1/2
700 x 65	28 x 2 1/2
750 x 65	30 x 2 1/2
800 x 65	32 x 2 1/2
830 x 65	33 x 2 1/2
860 x 65	34 x 2 1/2
700 x 85	28 x 3 1/4
750 x 85	30 x 3 1/4
800 x 85	32 x 3 1/4
860 x 85	34 x 3 1/4
760 x 90	30 x 3 1/2
810 x 90	32 x 3 1/2
840 x 90	32 x 3 1/2
870 x 90	34 x 3 1/2
910 x 90	36 x 3 1/2
960 x 90	38 x 3 1/2
1010 x 90	40 x 3 1/2
815 x 105	32 x 4

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We Extend an Invitation

to automobile manufacturers, owners of cars and others interested in the subject of materials for Automobile Tops and Upholstery to visit our

COMPLETE EXHIBIT OF

Pantasote Leather

At the Following Automobile Shows

New York, Madison Square Garden, Jan. 12-19, space 161, Concert Hall. Chicago Coliseum, Feb. 2-9, space 64, In Gallery. Boston, Mar. 9-16, space 205

To be appreciated and its advantages realized **Pantasote** must be seen This will be a splendid opportunity to investigate the merits of this superior article. *SAMPLES ON APPLICATION*

Beware of Imitations of Pantasote—There are many on the market and unscrupulous dealers offer them as **Pantasote** leather. Insist on **Pantasote** and you will be delighted and thoroughly satisfied with its wear, appearance and cost.

THE PANTASOTE COMPANY

NEW YORK: 11 Broadway CHICAGO: 926 Monadnock Bld'g

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Metric Sizes	Approximate Size in Inches
875 x 105	34 x 4
915 x 105	36 x 4
820 x 120	32 x 4 1/2–5
850 x 120	33 x 4 1/2-5
880 x 120	34 x 4 1/2–5
920 x 120	36 x 4 1/2–5
1020 x 120	40 x 4 1/2–5
1080 x 120	42 x 4 1/2–5

PROPORTIONS BETWEEN AXLE LOADS AND TIRE SIZES ADOPTED BY AMERICAN TIRE MAKERS

3 1/2-inch tires, all diameters	225 pounds per wheel
2- inch tires, all diameters	350 " " "
3 1/2 x 28-inch tires	400 " " "
3 1/2 x 30-inch tires	450 " " "
3 1/2 x 32-inch tires	555 " " "
3 1/2 x 34-inch tires	600 " " "
3 1/2 x 36-inch tires	600 " " "
4 x 30-inch tires	550 " " "
4 x 32-inch tires	650 " " "
4 x 34-inch tires	700 " " "
4 x 36-inch tires	750 " " "
4 1/2 x 32-inch tires	700 " " "
4 1/2 x 34-inch tires	800 " " "
4 1/2 x 36-inch tires	900 " " "

For weights in excess o' 1,000 pounds per wheel, 5-inch tires and over are recom mended. Weights given apply to car without passengers.

AIR PRESSURES FOR INFLATING PNEUMATIC TIRES RECOMMENDED BY LEADING MAKERS

Diameter of Tire, Inches	Maximum Weight on Wheel, lbs.	Air Pressure in Tire, lbs. per Square Inch
2 1/2	225	50
3	350	60
3 1/2	600	70
4	750	80
4 1/2	1,000	90
5	1,000	90

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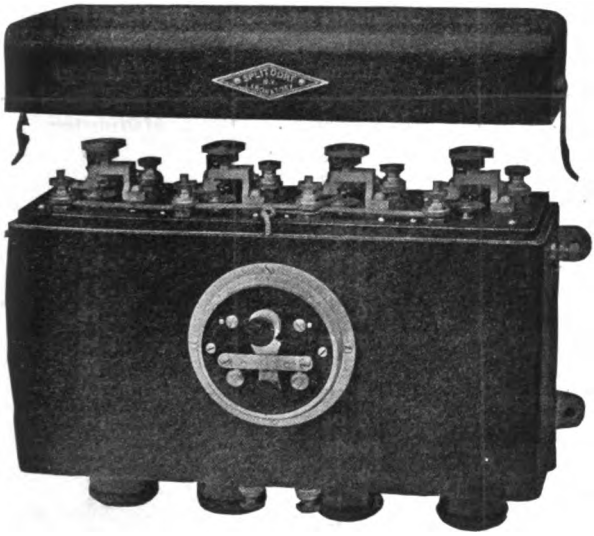
SPLITDORF COILS



Can be depended upon.

That is one of the reasons for their popularity. Most of the races won and records broken were with cars equipped with Splitdorf Coils.

This proves their superiority.

Splitdorf Coils, Commutators, Spark Plugs and Ignition Cables are all carefully constructed. Only the highest grade material enter into their manufacture.

If your customers are having trouble with Ignition Apparatus, sell them "SPLITDORF"—It will overcome all their troubles—please them—and put money in YOUR pocket. Write for particulars.

C. F. SPLITDORF, 17–27 Vandewater Street NEW YORK.

TRUFFAULT-HARTFORD SHOCK ABSORBER

Equip Your Car with

Truffault-Hartford Shock Absorbers

The Pioneer — The Best

For ECONOMY, SPEED, COMFORT

"Ask anyone who uses them"

1907 Model Automatically Lubricated
Guaranteed 10,000 Miles without Readjustment

HARTFORD SUSPENSION COMPANY

E. V. HARTFORD, President — 67 VESTRY ST., NEW YORK

Cars equipped in a few hours at our Garage, 212-214 West 88th Street

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INTERNATIONAL (METRIC SYSTEM) STANDARD 60° THREADS

Diameter of Screw	Pitch	Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread
Millimetres	*Millimetres*	*Millimetres*	*Millimetres*
3	.5	2.35	.06
4	.75	3.03	.09
5	.75	4.03	.09
6	1.0	4.70	.13
7	1.0	5.70	.13
8	1.0	6.70	.13
8	1.25	6.38	.16
9	1.0	7.70	.13
9	1.25	7.38	.16
10	1.5	8.05	.19
11	1.5	9.05	.19
12	1.5	10.05	.19
12	1.75	9.73	.22
14	2.0	11.40	.25
16	2.0	13.40	.25
18	2.5	14.75	.31
20	2.5	16.75	.31
22	2.5	18.75	.31
22	3.0	18.10	.38
24	3.0	20.10	.38
26	3.0	22.10	.38
27	3.0	23.10	.38
28	3.0	24.10	.38
30	3.5	25.45	.44
32	3.5	27.45	.44
33	3.5	28.45	.44
34	3.5	29.45	.44
36	4.0	30.80	.5
38	4.0	32.80	.5
39	4.0	33.80	.5
40	4.0	34.80	.5
42	4.5	36.15	.56
44	4.5	38.15	.56
45	4.5	39.15	.56
46	4.5	40.15	.56
48	5.0	41.51	.63
50	5.0	43.51	.63
52	5.0	45.51	.63
56	5.5	48.86	.69
60	5.5	52.86	.69
64	6.0	56.21	.75
68	6.0	60.21	.75
72	6.5	63.56	.81
76	6.5	67.56	.81
80	7.0	70.91	.88

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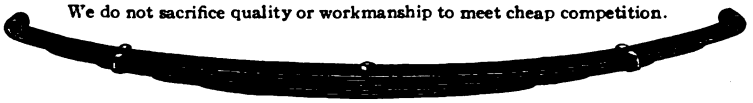
AUTOMOBILE LEAF SPRINGS

We do not sacrifice quality or workmanship to meet cheap competition.



Every spring is rigorously tested, inspected and recorded, so that a duplicate can be secured at any time. We have crucible steel, experienced, highest-skilled mechanics and up-to-date equipment.

Established 1880.

TUTHILL SPRING CO., 213 W. Polk Street, Chicago.

International Tires

International Rubber Co.

Milltown, N. J., U. S. A.

BOSTON
805 Boylston Street
BUFFALO
908 Main Street
DETROIT
214 Jefferson Avenue
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915 Nicollet Avenue

CHICAGO
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35 North Pryor Street
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1040 South Main Street
SAN FRANCISCO
426 Golden Gate Avenue

Perfection Springs

Type "A"

Type "G"

We recommend Perfection Springs because they accommodate their action to the variation of passenger weight, variation of road surface and momentum of car. But we make good springs of every type from high grade steel — oil tempered, hand fitted and warranted. Send for complete Catalog of our full line

The Perfection Spring Company

AUTOMOBILE SPRING SPECIALISTS

2414-2420 Superior Ave., N. W., CLEVELAND, OHIO

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UNITED STATES STANDARD 60° SCREW THREADS

Diameter of Screw	Threads per Inch	Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread
1/4	20	.185	.0062
5/16	18	.2403	.0069
3/8	16	.2936	.0078
7/16	14	.3447	.0089
1/2	13	.4001	.0096
9/16	12	.4542	.0104
5/8	11	.5069	.0114
3/4	10	.6201	.0125
7/8	9	.7307	.0139
1	8	.8376	.0156
1 1/8	7	.9394	.0179
1 1/4	7	1.0644	.0179
1 3/8	6	1.1585	.0208
1 1/2	6	1.2835	.0208
1 5/8	5 1/2	1.3888	.0227
1 3/4	5	1.4902	.0250
1 7/8	5	1.6152	.0250
2	4 1/2	1.7113	.0278
2 1/4	4 1/2	1.9613	.0278
2 1/2	4	2.1752	.0313
2 3/4	4	2.4252	.0313
3	3 1/2	2.6288	.0357
3 1/4	3 1/2	2.8788	.0357
3 1/2	3 1/4	3.1003	.0385
3 3/4	3	3.3170	.0417
4	3	3.5670	.0417
4 1/4	2 7/8	3.7982	.0435
4 1/2	2 3/4	4.0276	.0455
4 3/4	2 5/8	4.2551	.0476
5	2 1/2	4.4804	.0500
5 1/4	2 1/2	4.7304	.0500
5 1/2	2 3/8	4.9530	.0526
5 3/4	2 3/8	5.2030	.0526
6	2 1/4	5.4226	.0556

STANDARD PROPORTIONS FOR MACHINE SCREWS.

The report of the committee on standard proportions for machine screws of the American Society of Mechanical Engineers is published in the October, 1906, proceedings of the society. The report is substantially in agreement with the recommendations adopted at the joint meeting held in New York, April 11, 1904.

The committee believes the following combined details to be essential in establishing and maintaining a standard for the diameters, threads and heads of machine screws, including, as it does, diameters, threads and limits for the taps which are to be used in connection therewith: (*a*) form of thread, (*b*) diameters, (*c*) number of threads per inch, (*d*) standard reference thread gauges, basic and for screws and taps, (*e*) working gauges for screws and taps, (*f*) limits of variation, measured in the angle of the thread, (*g*) limits of variation in external diameter, (*h*) limits of variation in the pitch of the thread, screws and taps, (*k*) proportions of the heads.

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Boston swelled the list of pleasure cars exhibited in this season's shows to A GRAND TOTAL OF 1788.

Over 33 per cent. of all—a total of 591 cars, were equipped with

Diamond

WRAPPED TREAD TIRES

The next highest three makes of tires *combined* equipped but 574 cars.

The year's results will confirm the judgment the leading automobile manufacturers have thus expressed.

Let us send you our 1907 "Instruction Book Catalogue."

THE DIAMOND RUBBER COMPANY, Akron, Ohio.

Harburg-Wien Tires

Made in Germany

VII.

¶ A set of four Harburg-Wien tires were used for 16 months on a 60 H. P. car in practically continuous touring use (distance not recorded) till the rubber was worn down to the canvas. During the whole period the owner had no tire troubles of any kind and the same tires were re-covered for further use.

¶ The fact that Harburg-Wien tires are so made that the rubber absolutely cannot separate from the canvas is one of the many reasons why their durability excels that of all rivals.

HARBURG TIRE COMPANY

234 WEST 58th STREET NEW YORK CITY

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PROPERTIES OF GASOLINE AND DENATURED ALCOHOL (MUNTZ)

Properties	Gasoline	Denatured Alcohol
Carbon	84.3 per cent.	41.5 per cent.
Hydrogen	15 7 per cent.	13.0 per cent.
Oxygen	.....	45.5 per cent.
Density at 15° C	.708	.834
Boiling point	88° C.	78.5° C.
Calories per Kg	*11,359.65	‡6,521.75
Weight evaporated per hour per dm.² (15.5 sq. in.) of surface:		
1. In experiment room; 18° C	9.37 g. (0.33 oz.)	3.47 g. (0.12 oz.)
2. Outside in the sun; 25° C	47.21 g. (1.66 oz.)	27.08 g. (0.95 oz.)

* 1,302 British heat units per lb. ‡ 752 British heat units per lb.

SPECIFIC GRAVITIES CORRESPONDING TO BAUME SCALE AT 60° FAH.

Baumé Degrees	Specific Gravity	Baumé Degrees	Specific Gravity
63	0.728	72	0.695
64	0.724	73	0.692
65	0.720	74	0.689
66	0.717	75	0.685
67	0.713	76	0.682
68	0.709	77	0.679
69	c.706	78	0.675
70	0.702	79	0.672
71	0.699	80	0.669

REVERSIBLE CHEMICAL EQUATIONS SHOWING CHANGES WHICH TAKE PLACE IN THE LEAD STORAGE BATTERY (LAMAR LYNDON)

CHARGE ←

(a) $PbO_2 + H_2SO_4 = PbSO_4 + H_2O + O$

(b) $Pb + H_2SO_4 = PbSO_4 + H_2$

(c) $c = (a) + (b) = PbO_2 + Pb + 2H_2SO_4 = 2PbSO_4 + 2H_2O$ (2)

→ DISCHARGE

Equation (*a*) expresses the reactions at the positive plate; (*b*) those at the negative and (*c*) the combined effect is the fundamental equation of the lead storage battery

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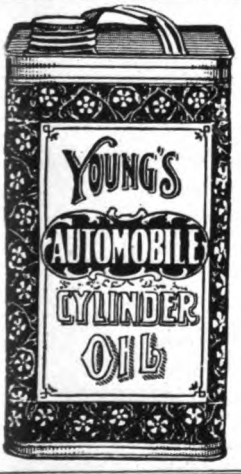

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FORMULAS FOR CONVERSION OF THERMOMETER SCALES

To convert degrees, Centigrade or Réaumur, into degrees Fahrenheit:

Let F = No. of degrees Fahrenheit.
C = " " " Centigrade.
R = " " " Réaumur.

$$F = \frac{9C}{5} + 32; \qquad F = \frac{9R}{4} + 32:$$

$$C = \frac{5\,(F - 32)}{9} \qquad R = \frac{4\,(F - 32)}{9}$$

Freezing point, or 32° Fah. = zero in Cent. or Réaumur.
Boiling point, or 212° Fah. = 100° Cent., or 80° Réaumur.

FRENCH AND AMERICAN EQUIVALENT MEASURES

MEASURES OF LENGTH

French	*United States*
1 meter	39.37 inches, or 3.28083 feet
.3048 meter	1 foot
1 centimeter	.3937 inch
2.54 centimeters	1 inch
1 millimeter	.03937 inch, or 1/25 inch nearly
25.4 millimeters	1 inch
1 kilometer	1093.61 yards, or .62137 mile

MEASURES OF WEIGHT

1 gramme	15.432 grains
.0648 gramme	1 grain
28.35 grammes	1 ounce avoirdupois
1 kilogramme	2.2046 pounds
.4536 kilogram	1 pound
1 tonne or metric ton	.9842 ton of 2,240 pounds 19.68 cwt.
1000 kilograms	2204.6 pounds

MEASURES OF CAPACITY

1 liter (1 cubic decimeter)	61.023 cubic inches .03531 cubic foot. .2642 gallon (American) 2.202 pounds water at 62° F.
28.317 liters	1 cubic foot
4.543 liters	1 gallon (British)
3.785 liters	1 gallon (American)

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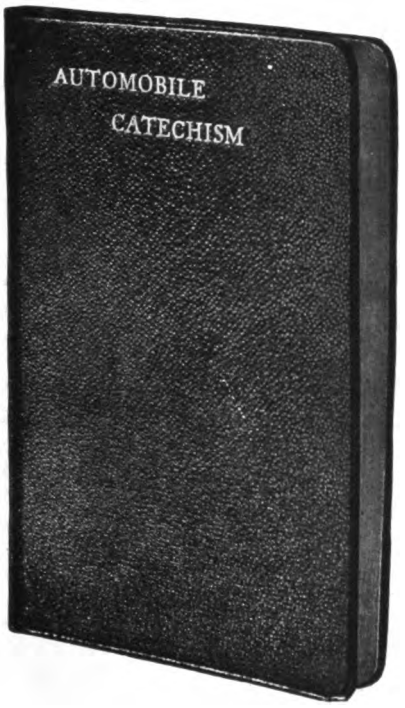

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TABLE OF DECIMAL EQUIVALENTS OF VULGAR FRACTIONS OF AN INCH IN COMMON USE

	1/64	.0156		17/64	.2656		33/64	.5156		49/64	.7656
	1/32	.0312		9/32	.2812		17/32	.5312		25/32	.7812
	3/64	.0468		19/64	.2968		35/64	.5468		51/64	.7968
1/16		.0625	5/16		.3125	9/16		.5625	13/16		.8125
	5/64	.0781		21/64	.3218		37/64	.5781		53/64	.8281
	3/32	.0937		11/32	.3437		19/32	.5937		27/32	.8437
	7/64	.1093		23/64	.3593		39/64	.6093		55/64	.8593
1/8		.125	3/8		.375	5/8		.625	7/8		.875
	9/64	.1406		25/64	.3906		41/64	.6406		57/64	.8906
	5/32	.1562		13/32	.4062		21/32	.6562		29/32	.9062
	11/64	.1718		27/64	.4218		43/64	.6718		59/64	.9218
3/16		.1875	7/16		.4375	11/16		.6875	15/16		.9375
	13/64	.2031		29/64	.4531		45/64	.7031		61/64	.9531
	7/32	.2187		15/32	.4687		23/32	.7187		31/32	.9687
	15/64	.2343		31/64	.4843		47/64	.7343		63/64	.9843
1/4		.25	1/2		.5	3/4		.75	1		1.0

TABLE OF APPROXIMATE CAPACITIES IN LIQUID GALLONS

1	2	3	4	5	6	7	8	9	10	Gallons	Gal'ns per Inch
5 x 12	6x18	6x24	6x36	6x42						6″ diam'r	.122
	7x12	7x18	7x24	7x30	7x36	7x42	7x48			7″ "	.165
		8x15	8x18	8x24	8x30	8x36	8x42	8x45	8x48	8″ "	.217
		9x12	9x15	9x18	9x24	9x30	9x34	9x36	9x40	9″ "	.275
					10x20	10x24	10x26	10x28	10x32	10″ "	.340
						12x16	12x18	12x20	12x24	12″ "	.486

10	15	20	25	30	35	40	45	50	Gallons	Gal'ns per Inch
8x48									8″ diam'r	.217
9x40									9″ "	.275
10x32	10x48								10″ "	.340
12x24	12x34	12x42	12x50	12x60					12″ "	.486
14x18	14x24	14x30	14x38	14x44	14x52	14x60			14″ "	.666
	16x18	16x24	16x30	16x36	16x42	16x48	16x54	16x60	16″ "	.870

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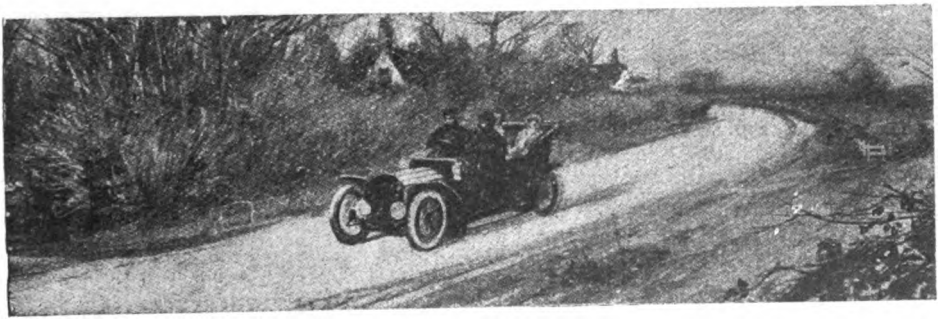

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Reference Table Showing Equivalent Speed in Miles and Kilometers per Hour for Elapsed Time Over the Measured Mile or Measured Kilometer from 24 Seconds Progressively by 1-5 Second to 59 4-5 Seconds.

Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres per hour.	Time of one Kilometre. m. s.	Equal to Kilometres per hour.	Equal to miles per hour
24	150.00	241.54	24	150.00	93.15
1/5	148.76	239.55	1/5	148.76	92.38
2/5	147.54	237.58	2/5	147.54	91.62
3/5	146.34	235.65	3/5	146.34	90.87
4/5	145.16	233.75	4/5	145.16	90.14
25	144.00	231.88	25	144.00	80.42
1/5	142.86	230.05	1/5	142.86	88.71
2/5	141.73	228.23	2/5	141.73	88.01
3/5	140.62	226.44	3/5	140.62	87.32
4/5	139.53	224.67	4/5	139.53	86.64
26	138.46	222.96	26	138.46	85.98
1/5	137.40	221.25	1/5	137.40	85.32
2/5	136.36	219.58	2/5	136.36	84.68
3/5	135.34	217.94	3/5	135.34	84.04
4/5	134.33	216.31	4/5	134.33	83.42
27	133.33	214.70	27	133.33	82.80
1/5	132.35	213.12	1/5	132.35	82.19
2/5	131.38	211.56	2/5	131.38	81.58
3/5	130.43	210.03	3/5	130.43	80.10
4/5	129.50	208.53	4/5	129.50	80.42
28	128.57	207.03	28	128.57	79.84
1/5	127.66	205.57	1/5	127.66	79.27
2/5	126.76	204.12	2/5	126.76	78.71
3/5	125.87	202.69	3/5	125.87	78.16
4/5	125.00	201.29	4/5	125.00	77.62
29	124.13	199.88	29	124.13	77.08
1/5	123.28	198.52	1/5	123.28	76.55
2/5	122.45	197.18	2/5	122.45	76.04
3/5	121.62	195.84	3/5	121.62	75.52
4/5	120.80	194.52	4/5	120.80	75.01
30	120.00	193.23	30	120.00	74.52
1/5	119.20	191.95	1/5	119.20	74.02
2/5	118.42	190.69	2/5	118.42	73.54
3/5	117.64	189.43	3/5	117.64	73.05
4/5	116.88	188.21	4/5	116.88	72.58
31	116.13	187.00	31	116.13	72.11
1/5	115.38	185.79	1/5	115.38	71.65
2/5	114.65	184.62	2/5	114.65	71.20
3/5	113.90	183.41	3/5	113 90	70.73
4/5	113.21	182.28	4/5	113.21	70.30
32	112.50	181.16	32	112.50	69.86
1/5	111.80	180.03	1/5	111.80	69.43
2/5	111.11	178.92	2/5	111.11	69.00
3/5	110.43	177.82	3/5	110.43	68.57
4/5	109.75	176.73	4/5	109.75	68.15
33	109.09	175.67	33	109.09	67.74
1/5	108.43	174.60	1/5	108.43	67.33
2/5	107.78	173.56	2/5	107.78	66.93
3/5	107.14	172.53	3/5	107.14	66.53
4/5	106.51	171.51	4/5	106.51	66.14
34	105.88	170.50	34	105.88	65.75
1/5	105.26	169.50	1/5	105.26	65.36
2/5	104.65	168.52	2/5	104.65	64.98
3/5	104.04	167.53	3/5	104.04	64.61
4/5	103.45	166.58	4/5	103.45	64.24
35	102.85	165.62	35	102.85	63.87
1/5	102.27	164.68	1/5	102.27	63.51
2/5	101.69	163.75	2/5	101.69	63.15
3/5	101.12	162.83	3/5	101.12	62.79
4/5	100 56	161.93	4/5	100.56	62.44
36	100.00	161.03	36	100.00	62.10
1/5	99.44	160.13	1/5	99.44	61.75
2/5	98.90	159.26	2/5	98.90	61.41
3/5	98.36	158.39	3/5	98.36	61.08
4/5	97.82	157.52	4/5	97.82	60.74
37	97.29	156.67	37	97.29	60.41
1/5	96.77	155.83	1/5	96.77	60.09
2/5	96.25	155.00	2/5	96.25	59.77
3/5	95.74	154.17	3/5	95.74	59.45
4/5	95.23	153.34	4/5	95.23	59.13
38	94.73	152.55	38	94.73	58.82
1/5	94.24	151.75	1/5	94.24	58.52
2/5	93.75	150.96	2/5	93.75	58.22
3/5	93.26	150.17	3/5	93.26	57.91
4/5	92.78	149.40	4/5	92.78	57.61
39	92.30	148.64	39	92.30	57.32
1/5	91.83	147.87	1/5	91.83	57.02
2/5	91.37	147.13	2/5	91.37	56.74
3/5	90.91	146.39	3/5	90.91	56.45
4/5	90.45	145.65	4/5	90.45	56.17
40	90.00	144.92	40	90.00	55.89
1/5	89.55	144.20	1/5	89.55	55.61
2/5	89.11	143.49	2/5	89.11	55.33
3/5	88.67	142.78	3/5	88.67	55.06
4/5	88.23	142.07	4/5	88.23	54.79
41	87.80	141 39	41	87.80	54.52
1/5	87.38	140.70	1/5	87.38	54.26
2/5	86.95	140.01	2/5	86.95	53.99
3/5	86.53	139.34	3/5	86.53	53.73
4/5	86.12	138.68	4/5	86.12	53.48
42	85.71	138.02	42	85.71	53.22
1/5	85.30	137.35	1/5	85.30	52.97
2/5	84.90	136.71	2/5	84.90	52.72
3/5	84.50	136.07	3/5	84.50	52.47
4/5	84.11	135.44	4/5	84.11	52.23
43	83.72	134.81	43	83.72	51.99
1/5	83.33	134.18	1/5	83.33	51.75
2/5	82.95	133.57	2/5	82.95	51.51
3/5	82.57	132.96	3/5	82.57	51.27
4/5	82.19	132.35	4/5	82.19	51.04
44	81.81	131.75	44	81.81	50.80
1/5	81.44	131.14	1/5	81.44	50.57
2/5	81.08	130.56	2/5	81.08	50 35
3/5	80.71	129.96	3/5	80.71	50.12
4/5	80.35	129.38	4/5	80.35	49.89
45	80.00	128.82	45	80.00	49.68
1/5	79.64	128.24	1/5	79.64	49.45
2/5	79.29	127.68	2/5	79.29	49.24
3/5	78 94	127.11	3/5	78.94	49.02
4/5	78.60	126.57	4/5	78.60	48.81

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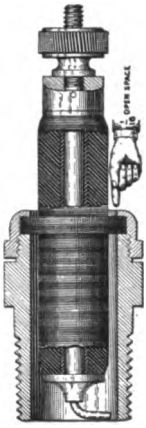

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No shellac or cement used.
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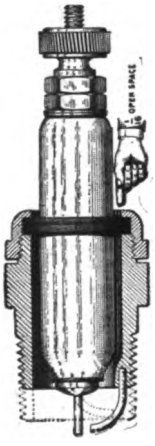

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46	78.26	126.02	46	78.26	48.60	53	67.92	109.38	53	67.92	42.18
1/5	77.92	125.47	1/5	77.92	48.39	1/5	67.66	108.95	1/5	67.66	42.01
2/5	77.58	124.92	2/5	77.58	48.17	2/5	67.41	108.55	2/5	67.41	41.86
3/5	77.25	124.39	3/5	77.25	47.97	3/5	67.16	108.14	3/5	67.16	41.70
4/5	76.92	123.86	4/5	76.92	47 76	4/5	66.91	107.74	4/5	66.91	41.55
47	76.59	123.34	47	76.59	47.56	54	66.66	107.34	54	66.66	41.39
1/5	76.27	122.81	1/5	76.27	47.36	1/5	66.42	106.95	1/5	66.42	41.24
2/5	75.95	122.30	2/5	75.95	47.16	2/5	66.17	106.55	2/5	66.17	41.09
3/5	75.63	121.78	3/5	75.63	46.96	3/5	65.93	106.16	3/5	65.93	40.94
4/5	75.31	121.27	4/5	75.31	46.76	4/5	65.69	105.78	4/5	65.69	40.79
48	75.00	120.77	48	75.00	46.57	55	65.45	105.40	55	65.45	40.64
1/5	74.68	120.25	1/5	74.68	46.37	1/5	65.21	105.00	1/5	65.21	40.49
2/5	74.38	119.77	2/5	74.38	46.19	2/5	64.98	104.63	2/5	64.98	40.35
3/5	74.07	119.27	3/5	74.07	46.00	3/5	64.74	104.25	3/5	64.74	40.20
4/5	73.77	118.79	4/5	73.77	45.81	4/5	64.51	103.88	4/5	64.51	40.05
49	73.47	118.30	49	73.47	45.62	56	64.28	103.52	56	64.28	39.92
1/5	73.17	117.82	1/5	73.17	45.44	1/5	64.05	103.14	1/5	64.05	39.77
2/5	72.87	117.34	2/5	72.87	45.25	2/5	63.83	102.78	2/5	63.83	39.64
3/5	72.58	116.87	3/5	72.58	45.07	3/5	63.60	102.41	3/5	63.60	39.49
4/5	72.29	116.40	4/5	72.29	44.89	4/5	63.38	102.06	4/5	63.38	39.36
50	72.00	115.94	50	72.00	44.71	57	63.16	101.70	57	63.16	39.22
1/5	71.71	115.47	1/5	71.71	44.53	1/5	62.93	101.33	1/5	62.93	39.08
2/5	71.42	115.00	2/5	71.42	44.35	2/5	62.71	100.98	2/5	62.71	38.94
3/5	71.14	114.55	3/5	71.14	44.18	3/5	62.50	100.64	3/5	62.50	38.81
4/5	70.86	114.10	4/5	70.86	44.00	4/5	62.28	100.29	4/5	62.28	38.67
51	70.58	113.67	51	70.58	43.83	58	62.07	99.95	58	62.07	38.54
1/5	70.31	113.22	1/5	70.31	43.66	1/5	61.85	99.59	1/5	61.85	38.41
2/5	70.04	112.78	2/5	70.04	43.49	2/5	61.64	99.25	2/5	61.64	38.28
3/5	69.76	112.33	3/5	69.76	43.32	3/5	61.43	98.92	3/5	61.43	38.15
4/5	69.49	111.90	4/5	69.49	43.15	4/5	61.22	98.58	4/5	61.22	38.01
52	69.23	111.48	52	69.23	42.90	59	61.01	98.24	59	61.01	37.88
1/5	68.96	111.04	1/5	68.96	42.82	1/5	60.81	97.92	1/5	60.81	37.76
2/5	68.70	110.62	2/5	68.70	42.66	2/5	60.60	97.58	2/5	60.60	37.63
3/5	68.44	110.21	3/5	68.44	42.50	3/5	60.40	97.26	3/5	60.40	37.51
4/5	68.18	109.79	4/5	68.18	42.34	4/5	60.20	96.94	4/5	60.20	37.38

(CONTINUED ON PAGE 220)

Steel Balls. "Standard" Sizes and Weights.

Size	Decimal	No. per Pound	Size	Decimal	Ounces
1/16"	.0625	27,904	13/16"	.8125	1 1/2
3/32"	.0937	8,264	7/8"	.8750	1 3/4
1/8"	.1250	3.400	15/16"	.9375	2
5/32"	.1563	1,770	1"	1.000	2 1/2
3/16"	.1875	1,030	1 1/8"	1.125	3 1/2
7/32"	.2188	640	1 1/4"	1.250	4 3/4
1/4"	2500	430	1 3/8"	1.375	6 1/4
9/32"	.2613	300	1 1/2"	1.500	8
5/16"	.3125	220	1 5/8"	1.625	10
11/32"	.2438	165	1 3/4"	1.750	13
3/8"	.3750	125	1 7/8"	1.875	15 1/2
7/16"	.4375	80	2"	2.000	19 1/4
1/2"	.5000	52	2 1/4"	2.250	27
9/16"	.5625	36	2 1/2"	2.500	37
5/8"	.6250	28	2 3/4"	2.750	49
11/16"	.6875	21	3"	3.000	64
3/4"	.7500	16	3 1/4"	3.250	81 1/2
			3 1/2"	3.500	101 1/2
			3 3/4"	3.750	125
			4"	4.000	152

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ONE 1906 Locomobile, like new, taken in exchange for 1907 model. Price, $1,250. Box N, Essex, Conn. March 21

Three insertions at 60c each, total cost, $1.80, sold this car.

To get Cash for Old Goods insert a Special Notice in the Automobile. Price 20 cents a line, 7 words to the line.

10% reduction for 6 insertions; 20% on 13 insertions

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_____ 190__

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Name_____

[Give Address in full]_____

Address may be given care of The Automobile and replies will be forwarded. _____

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Reference Table Showing Equivalent Speed in Miles and Kilometers per Hour for Elapsed Time Over the Measured Mile or Measured Kilometer from 1 Minute to 30 Minutes.

Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres per hour.	Time of one Kilometre. m. s.	Equal to Kilometres per hour.	Equal to miles per hour.
1 0	60.00	96.61	1 0	60.00	37.26
1 1	59.00	95.00	1 1	59.00	36.64
1 2	58.06	93.49	1 2	58.06	36.05
1 3	57.14	92.01	1 3	57.14	35.48
1 4	56.25	90.58	1 4	56.25	34.93
1 5	55.38	89.17	1 5	55.38	34.39
1 6	54.54	87.82	1 6	54.54	33.87
1 7	53.73	86.52	1 7	53.73	33.36
1 8	52.94	85.25	1 8	52.94	32.87
1 9	52.17	84.01	1 9	52.17	32.40
1 10	51.42	82.80	1 10	51.42	31.93
1 11	50.70	81.64	1 11	50.70	31.48
1 12	50.00	80.51	1 12	50.00	31.05
1 13	49.31	79.40	1 13	49.31	30.62
1 14	48.65	78.34	1 14	48.65	30.21
1 15	48.00	77.29	1 15	48.00	29.81
1 16	47.37	76.28	1 16	47.37	29.41
1 17	46.75	75.28	1 17	46.75	29.03
1 18	46.15	74.31	1 18	46.15	28.66
1 19	45.57	73.38	1 19	45.57	28.30
1 20	45.00	72.46	1 20	45.00	27.94
1 21	44.44	71.56	1 21	44.44	27.60
1 22	43.90	70.69	1 22	43.90	27.26
1 23	43.37	69.84	1 23	43.37	26.93
1 24	42.85	69.00	1 24	42.85	26.61
1 25	42 35	68.19	1 25	42.35	26.30
1 26	41.86	67.40	1 26	41.86	26.00
1 27	41.38	66.63	1 27	41.38	25.7
1 28	40.91	65.87	1 28	40.91	25.40
1 29	40.45	65.13	1 29	40.45	25.10
1 30	40.00	64.41	1 30	40.00	24.84
1 31	39.56	63.70	1 31	39.56	24.56
1 32	39.13	63.01	1 32	39.13	24.30
1 33	38.71	62.33	1 33	38.71	24.04
1 34	38.29	61.66	1 34	38.29	23.77
1 35	37.89	61.01	1 35	37.89	23.53
1 36	37.50	60.38	1 36	37.50	23.28
1 37	37.11	59.76	1 37	37.11	23.04
1 38	36.73	59.14	1 38	36.73	22.81
1 39	36.36	58.55	1 39	36.36	22.58
1 40	36.00	57.97	1 40	36.00	22.35
1 41	35.64	57.39	1 41	35.64	22.13
1 42	35.29	56.82	1 42	35.29	21.91
1 43	34.95	56.28	1 43	34.95	21.70
1 44	34.61	55.73	1 44	34.61	21.50
1 45	34.28	55.20	1 45	34.28	21.28
1 46	33.96	54.68	1 46	33.96	21.09
1 47	33.64	54.17	1 47	33.64	20.89
1 48	33.33	53.67	1 48	33.33	20.70
1 49	33.03	53.19	1 49	33.03	20.51
1 50	32.72	52.69	1 50	32.72	20.32
1 51	32.43	52.22	1 51	32.43	20.14
1 52	32.14	51.75	1 52	32.14	19.96
1 53	31.86	51.30	1 53	31.86	19.78
1 54	31.58	50.85	1 54	31.58	19.61
1 55	31.30	50.40	1 55	31.30	19.43
1 56	31.03	49.96	1 56	31.03	19.27
1 57	30.77	49.55	1 57	30.77	19.11
1 58	30.50	49.11	1 58	30.50	18.94
1 59	30.25	48.71	1 59	30.25	18.78
2 0	30.00	48.30	2 0	30.00	18.63
2 3	29.26	47.11	2 3	29.26	18.17
2 6	28.57	46.00	2 6	28.57	17.74
2 9	27.90	44.92	2 9	27.90	17.32
2 12	27.27	43.91	2 12	27.27	16.93
2 15	26.66	42.93	2 15	26.66	16.55
2 18	26.08	42.00	2 18	26.08	16.20
2 21	25.53	41.11	2 21	25.53	15.85
2 24	25.00	40.25	2 24	25.00	15.52
2 27	24.49	39.43	2 27	24.49	15.21
2 30	24.00	38.64	2 30	24.00	14.90
2 33	23.53	37.89	2 33	23 53	14.61
2 36	23.07	37.15	2 36	23.07	14.32
2 39	22.64	36.45	2 39	22.64	14.06
2 42	22.22	35.78	2 42	22.22	13 80
2 45	21.81	35.12	2 45	21.81	13.54
2 48	21.42	34.49	2 48	21.42	13.31
2 51	21.05	33.89	2 51	21.05	13.07
2 54	20.69	33.31	2 54	20.69	12.85
2 57	20.34	32.75	2 57	20.34	12.63
3 0	20.00	32.20	3 0	20.00	12.42
3 6	19.35	31.16	3 6	19.35	12.01
3 12	18.75	30.19	3 12	18.75	11.64
3 18	18.18	29.27	3 18	18.18	11.29
3 24	17.64	28.40	3 24	17.64	10.95
3 30	17.14	27.60	3 30	17.14	10.64
3 36	16.66	26.82	3 36	16.66	10.34
3 42	16.21	26.10	3 42	16.21	10.06
3 48	15.79	25.42	3 48	15.79	9.80
3 54	15.38	24.76	3 54	15.38	9.55
4 0	15.00	24.15	4 0	15.00	9.31
4 6	14.63	23.56	4 6	14.63	9.08
4 12	14.28	22.99	4 12	14.28	8.86
4 18	13.95	22.46	4 18	13 95	8.66
4 24	13.63	21.95	4 24	13.63	8.46
4 30	13.33	21.46	4 30	13.33	8.28
4 36	13.04	21.00	4 36	13.04	8.10
4 42	12.76	20.54	4 42	12.76	7.92
4 48	12.50	20.13	4 48	12.50	7.76
4 54	12.24	19.71	4 54	12.24	7.60
5 0	12.00	19.32	5 0	12.00	7.45
5 12	11.54	18.58	5 12	11.54	7.16
5 24	11.11	17.89	5 24	11.11	6.90
5 36	10.71	17.24	5 36	10.71	6.65
5 48	10.34	16.65	5 48	10.34	6.42
6 0	10.00	16.10	6 0	10.00	6.21
6 15	9.60	15.46	6 15	9.60	5.96
6 30	9.23	14.86	6 30	9.23	5.73
6 45	8.88	14.30	6 45	8.88	5.51
7 0	8.57	13.80	7 0	8.57	5.32
7 15	8.27	13.31	7 15	8.27	5.13
7 30	8.00	12.88	7 30	8.00	4.97
7 45	7.74	12.46	7 45	7.74	4.80
8 0	7.50	12.08	8 0	7.50	4.66
8 30	7.06	11.37	8 30	7.06	4.38
9 0	6.66	10.72	9 0	6.66	4.13
9 30	6.31	10.16	9 30	6.31	3.92
10 0	6.00	9.66	10 0	6.00	3.72
10 30	5.71	9.19	10 30	5.71	3.54
11 0	5.45	8.77	11 0	5.45	3.38
11 30	5.21	8.39	11 30	5.21	3.23
12 0	5.00	8.05	12 0	5.00	3.10
13 0	4.61	7 42	13 0	4.61	2.86
14 0	4.28	6.89	14 0	4.28	2.66
15 0	4.00	6.44	15 0	4.00	2.48
20 0	3.00	4.83	20 0	3 00	1.86
30 0	2.00	3.22	30 0	2.00	1.24

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Motor boat measured mile speed table (elapsed time) in nautical miles (admiralty knot = 6,080 feet) and statute miles (5,280 feet) from 1 min. to 8 min. 59 sec., progressively by seconds. For slower speeds divide elapsed time by 2 and divide result by 2.

Seconds	1 Minute	Equivalent in Miles	2 Minutes	Equivalent in Miles	3 Minutes	Equivalent in Miles	4 Minutes	Equivalent in Miles	5 Minutes	Equivalent in Miles	6 Minutes	Equivalent in Miles	7 Minutes	Equivalent in Miles	8 Minutes	Equivalent in Miles
0	60.00	69.06	30.00	34.54	20.00	23.03	15.00	17.27	12.00	13.81	10.00	11.51	8.57	9.86	7.50	8.63
1	59.01	67.95	29.75	34.25	19.89	22.90	14.93	17.20	11.96	13.77	9.97	11.48	8.55	9.84	7.48	8.61
2	58.06	66.86	29.50	33.97	19.78	22.88	14.87	17.12	11.92	13.72	9.94	11.45	8.53	9.82	7.46	8.60
3	57.14	65.80	29.26	33.70	19.67	22.65	14.81	17.05	11.88	13.68	9.91	11.41	8.51	9.80	7.45	8.58
4	56.25	64.77	29.03	33.43	19.56	22.52	14.75	16.98	11.84	13.63	9.89	11.38	8.49	9.77	7.43	8.56
5	55.38	63.77	28.80	33.16	19.45	22.40	14.69	16.92	11.80	13.59	9.86	11.35	8.47	0.75	7.42	8.54
6	54.54	62.80	28.57	32.89	19.35	22.28	14.63	16.85	11.76	13.54	9.83	11.32	8.45	9.73	7.40	8.52
7	53.73	61.87	28.34	32.64	19.25	22.16	14.57	16.78	11.72	13.50	9.80	11.29	8.43	9.70	7.39	8.51
8	52.94	60.96	28.12	32.38	19.14	22.05	14.51	16.71	11.68	13.45	9.78	11.26	8.41	9.68	7.37	8.49
9	52.17	60.07	27.90	32.13	19.04	21.93	14.45	16.64	11.65	13.41	9.75	11.23	8.39	9.66	7.36	8.47
10	51.42	59.21	27.69	31.88	18.94	21.81	14.40	16.58	11.61	13.37	9.73	11.20	8.37	9.64	7.34	8.46
11	50.70	58.38	27.48	31.64	18.84	21.70	14.34	16.51	11.57	13.32	9.70	11.17	8.35	9.61	7.33	8.44
12	50.00	57.57	27.27	31.40	18.75	21.59	14.28	16.45	11.53	13.28	9.67	11.14	8.33	9.59	7.31	8.42
13	49.31	56.78	27.06	31.16	18.65	21.47	14.22	16.38	11.50	13.24	9.65	11.11	8.31	9.57	7.30	8.40
14	48.64	56.01	26.86	30.83	18.55	21.36	14.17	16.32	11.46	13.20	9.62	11.08	8.29	9.55	7.28	8.39
15	48.00	55.27	26.66	30.70	18.46	21.25	14.11	16.25	11.42	13.16	9.60	11.05	8.27	9.52	7.27	8.37
16	47.36	54.54	26.47	30.48	18.36	21.14	14.06	16.19	11.39	13.11	9.57	11.02	8.25	9.50	7.25	8.35
17	46.75	53.83	26.27	30.25	18.27	21.04	14.00	16.13	11.35	13.07	9.54	10.99	8.23	9.48	7.24	8.34
18	46.15	53.14	26.08	30.03	18.18	20.93	13.95	16.06	11.32	13.02	9.52	10.96	8.21	9.46	7.22	8.32
19	45.57	52.47	25.89	29.82	18.09	20.83	13.90	16.00	11.28	12.99	9.49	10.93	8.20	9.44	7.21	8.30
20	45.00	51.81	25.71	29.40	18.00	20.72	13.84	15.94	11.25	12.95	9.47	10.90	8.18	9.42	7.20	8.29
21	44.44	51.17	25.53	29.39	17.91	20.62	13.79	15.88	11.21	12.91	9.44	10.88	8.16	9.39	7.18	8.27
22	43.90	50.55	25.35	29.17	17.82	20.52	13.74	15.82	11.18	12.87	9.42	10.85	8.14	9.37	7.17	8.25
23	43.37	49.94	25.17	28.98	17.73	20.42	13.68	15.76	11.14	12.83	9.39	10.82	8.12	9.35	7.15	8.24
24	42.85	49.34	25.00	28.78	17.64	20.32	13.63	15.70	11.11	12.79	9.37	10.79	8.10	9.33	7.14	8.22
25	42.35	48.76	24.82	28.58	17.56	20.22	13.58	15.64	11.07	12.75	9.35	10.76	8.09	9.31	7.12	8.20
26	41.86	48.20	24.65	28.39	17.47	20.12	13.53	15.58	11.04	12.71	9.32	10.73	8.07	9.29	7.11	8.19
27	41.37	47.64	24.49	28.20	17.39	20.02	13.48	15.52	11.00	12.67	9.30	10.71	8.05	9.27	7.10	8.17
28	40.90	47.10	24.32	28.00	17.30	19.93	13.43	15.46	10.97	12.63	9.27	10.68	8.03	9.25	7.08	8.16
29	40.45	46.57	24.16	27.82	17.22	19.83	13.38	15.41	10.94	12.59	9.25	10.65	8.01	9.23	7.07	8.14
30	40.00	46.06	24.00	27.63	17.14	19.74	13.33	15.35	10.90	12.56	9.23	10.62	8.00	9.21	7.05	8.12
31	39.56	45.55	23.84	27.45	17.06	19.64	13.28	15.29	10.87	12.52	9.20	10.60	7.98	9.19	7.04	8.11
32	39.13	45.05	23.68	27.27	16.98	19.54	13.23	15.24	10.84	12.48	9.18	10.57	7.96	9.17	7.03	8.09
33	38.71	44.57	23.52	27.09	16.90	19.46	13.18	15.18	10.81	12.44	9.16	10.54	7.94	9.15	7.01	8.08
34	38.29	44.10	23.37	26.91	16.82	19.37	13.13	15.12	10.77	12.41	9.13	10.52	7.93	9.13	7.00	8.06
35	37.89	43.63	23.22	26.74	16.74	19.28	13.09	15.07	10.74	12.37	9.11	10.49	7.91	9.11	6.99	8.04
36	37.50	43.18	23.07	26.57	16.66	19.19	13.04	15.01	10.71	12.33	9.09	10.46	7.89	9.09	6.97	8.03
37	37.11	42.73	22.93	26.40	16.59	19.10	12.99	14.96	10.68	12.30	9.06	10.44	7.87	9.07	6.96	8.01
38	36.73	42.30	22.78	26.23	16.51	19.01	12.95	14.91	10.65	12.26	9.04	10.41	7.86	9.05	6.95	8.00
39	36.36	41.87	22.64	26.07	16.43	18.92	12.90	14.85	10.61	12.22	9.02	10.38	7.84	9.03	6.93	7.98
40	36.00	41.45	22.50	25.90	16.36	18.84	12.85	14.80	10.58	12.19	9.00	10.36	7.82	9.01	6.92	7.97
41	35.64	41.04	22.36	25.74	16.29	18.75	12.81	14.75	10.55	12.15	8.97	10.33	7.80	8.99	6.91	7.95
42	35.29	40.64	22.22	25.58	16.21	18.67	12.76	14.70	10.52	12.12	8.95	10.31	7.79	8.97	6.89	7.94
43	34.95	40.24	22.08	25.43	16.14	18.58	12.72	14.64	10.49	12.08	8.93	10.28	7.77	8.95	6.88	7.92
44	34.61	39.85	21.95	25.27	16.07	18.50	12.67	14.59	10.46	12.05	8.91	10.26	7.75	8.93	6.87	7.91
45	34.28	39.48	21.81	25.12	16.00	18.42	12.63	14.54	10.43	12.01	8.88	10.23	7.74	8.91	6.85	7.89
46	33.96	39.10	21.68	24.97	15.92	18.34	12.58	14.49	10.40	11.98	8.86	10.21	7.72	8.89	6.84	7.88
47	33.64	38.74	21.55	24.82	15.85	18.26	12.54	14.44	10.37	11.94	8.84	10.18	7.70	8.87	6.83	7.86
48	33.33	38.38	21.42	24.67	15.78	18.18	12.50	14.39	10.34	11.91	8.82	10.16	7.69	8.85	6.81	7.84
49	33.02	38.03	21.30	24.52	15.72	18.10	12.45	14.34	10.31	11.87	8.80	10.13	7.67	8.83	6.80	7.83
50	32.72	37.68	21.17	24.38	15.65	18.02	12.41	14.29	10.28	11.84	8.78	10.11	7.66	8.82	6.79	7.82
51	32.43	37.34	21.05	24.24	15.58	17.94	12.37	14.24	10.25	11.80	8.75	10.08	7.64	8.80	6.78	7.80
52	32.14	37.01	20.93	24.10	15.51	17.86	12.32	14.19	10.22	11.77	8.73	10.06	7.62	8.78	6.76	7.79
53	31.85	36.68	20.80	23.96	15.45	17.79	12.28	14.14	10.19	11.74	8.71	10.03	7.61	8.76	6.75	7.77
54	31.57	36.36	20.69	23.82	15.38	17.71	12.24	14.10	10.16	11.70	8.69	10.01	7.59	8.74	6.74	7.76
55	31.30	36.08	20.57	23.68	15.31	17.63	12.20	14.05	10.14	11.67	8.67	9.98	7.57	8.72	6.72	7.74
56	31.03	35.73	20.45	23.55	15.25	17.56	12.16	14.00	10.11	11.64	8.65	9.96	7.56	8.70	6.71	7.73
57	30.76	35.43	20.33	23.42	15.19	17.49	12.12	13.95	10.08	11.61	8.63	9.04	7.54	8.69	6.70	7.71
58	30.50	35.12	20.22	23.28	15.12	17.41	12.08	13.28	10.05	11.57	8.61	9.91	7.53	8.67	6.69	7.70
59	30.25	34.83	20.11	23.16	15.06	17.34	12.04	13.86	10.02	11.54	8.59	9.89	7.51	8.65	6.67	7.69

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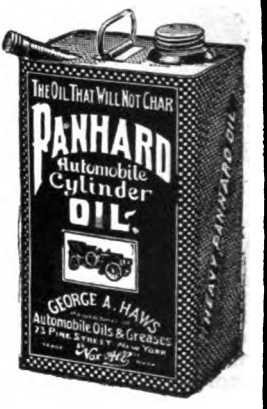

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VOL. V NO. 3
JULY, 1907

Subscription Price $1.00 per year
Single Copies 25 Cents, Postpaid

Published by
The Class Journal Company
Flatiron Building, New York

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The Automobile Trade Directory

PUBLICATION OFFICE:
Flatiron Building, New York
ROBERT WOLFERS, *Manager*

WESTERN OFFICE:
836 Monadnock Block, Chicago
H. E. WESTERDALE, *Representative*

Address all communications to
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TO THE TRADE

IN compiling this Directory we have included all the available names of American manufacturers of complete automobiles, commercial vehicles, motor boats and motor cycles, and of all makers of parts and accessories.

Manufacturers' names are classified under the headings of the various products, and the classifications are completely indexed. We will consider it a favor if manufacturers will notify us at once in case their names are not included in the Directory, or the information given is in any way incorrect or incomplete, as it is our intention to make the Directory of unquestionable accuracy.

For the convenience of mechanical engineers and purchasing agents we have incorporated a department under the heading "Tables and Data for Engineers." This information has been compiled from authoritative sources with a view to its usefulness to those actively engaged in the automobile industry. In subsequent editions additional tables and data will be included and any suggestions or data which will make this department more valuable and which our readers may favor us with will be appreciatively received.

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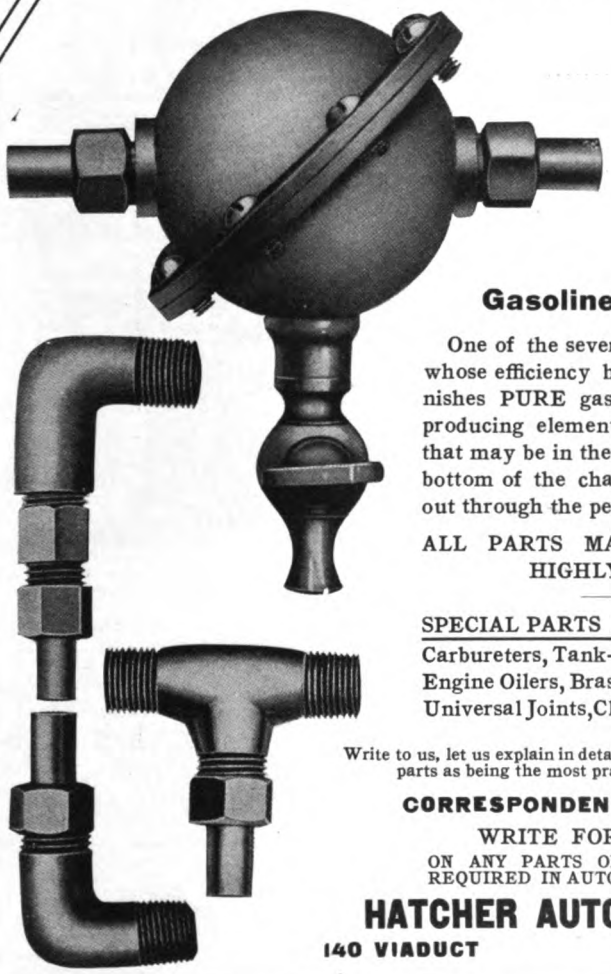

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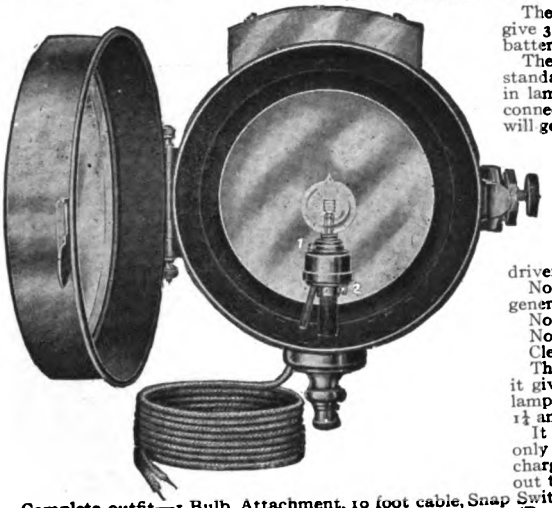

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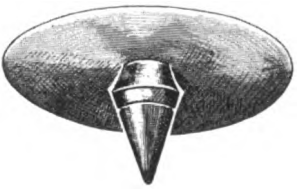

Full Size, 1 1-2 inch.

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ABENDROTH & Root Mfg. Co., Newburgh, N. Y.

ADAMS Co. (The), Dubuque, Ia.

ADAMS Automobile Co., Hiawatha, Kan.

AEROCAR Co. (The), Mack Ave., Detroit Mich.

ALBANY Automobile Co., Albany, Ind.

AMERICAN Foundry Co., Leipsic, O.

AMERICAN Locomotive Automobile Co., Providence, R. I.

AMERICAN Motor Car Co., Indianapolis, Ind.

APPERSON Bros. Auto. Co., Kokomo, Ind.

ATLAS Motor Car Co., Springfield, Mass.

AUBURN Auto Co., Auburn, Ind.

AURORA Motor Works, North Aurora, Ill.

AUSTIN Auto Co., Grand Rapids, Mich.

AUTOCAR Co. (The), Ardmore, Pa.

AUTO Vehicle Co., S. Main, Tenth, and S. Los Angeles Sts., Los Angeles, Cal.

B. L. M. Motor Car & Equip. Co., 31-33 Delevan St., Brooklyn, N. Y.

BAILEY Automobile Co., Springfield, Mass.

BARNES Mfg. Co., Sandusky, Ohio.

BARTHOLOMEW Co. (The), Peoria, Ill.

BAY STATE Auto Co., 112 Norway St., Boston, Mass.

BELLEFONTAINE Auto Co., Bellefontaine, Ohio.

BERKSHIRE Motor Car Company, Pittsfield, Mass.

BLOMSTROM Manufacturing Co., Detroit, Mich.

BRUSH Runabout Co., 14 Baltimore Ave., W., Detroit, Mich.

BUCKEYE Mfg. Co., Anderson, Ind.

BUICK Motor Co., Flint and Jackson, Mich.

CADILLAC Motor Car Co., 1343 Cass Ave., Detroit, Mich.

C.V.I. Automobile Co., Jackson, Mich.

CAMERON Car Co., Brockton, Mass.

CARTER Motor Car Corporation, Detroit, Mich.

CHADWICK Engineering Works, Spring Garden and 32d Sts., Philadelphia, Pa.

CHALFANT Gasolene Motor Car Co., Lenover, Pa.

CHICAGO Coach & Carriage Co., Chicago, Ill.

CHICAGO Recording Scale Co., Waukegan, Ill.

CHRISTIE Direct Action Motor Car Co., 519 E. 18th St., N. Y. City.

CLEVELAND Motor Car Co., 1372 E. 12th St., Cleveland, O.

COLBURN Automobile Co., Denver, Colo.

COLT Runabout Co., Yonkers, N. Y.

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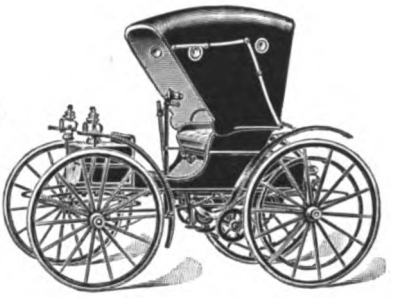
Five Years of Success



THE HOLSMAN AUTOMOBILE has now been on the market five years and has long since passed the experimental stage. It is built high enough to travel the country roads like a carriage and can be run twelve months in the year. It clears the center of the road by eighteen inches, and therefore has **TWICE THE ADVANTAGE** of the ordinary machine in muddy, rutty, rough or rocky roads. Has large wheels, solid rubber tires and **RIDES LIKE A CARRIAGE.** The Holsman exclusive patent marks an era in automobile building. It does away with all live axles, friction clutches, differential gears, pumps, etc. Reverses without extra gears. **No water to freeze; No puncture troubles; No odor; New hill climbing power.**

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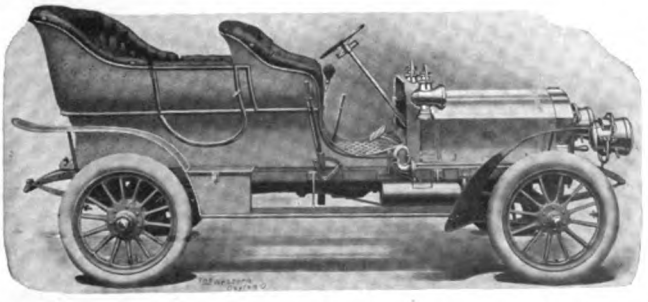

The car that strikes the ideal medium between exorbitant frills and cheap unworthiness.

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Stoddard-Dayton Model D. 4-cylinder, vertical motor, 4½x5 cylinders, 30-35 H.P., selective type sliding gear transmission, 3 speeds and reverse, controlled by a single lever operating in a guide of the H-slot type. Operator can pass from any gear to other gear at will, up hill or down without noise or clashing. Roller bearings throughout, floating type, clutch driven rear axle with large bevel gears, mechanical lubrication. 2,100 pounds, $2,250. Advance catalog ready. Write for our new catalog fully describing the Stoddard Dayton Touring Car, Runabout and Limousine for 1907.

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COLUMBUS Buggy Co., Columbus, O.

CONOVER Motor Car Co. (The), Paterson, N. J.

CONTINENTAL Automobile Mfg. Co., 166 St. John St., New Haven, Conn.

COPPOCK Motor Car Co., Marion, Ind.

CORBIN Motor Vehicle Corporation, New Britain, Conn.

CORNISH-Friedberg Motor Car Co., 1220 Michigan Ave., Chicago, Ill.

COVERT Motor Vehicle Co., 57 Richmond Ave., Lockport, N. Y.

CRAIG-Toledo Motor Car Co. (The), Toledo, O.

CRAWFORD Auto Co., Hagerstown, Md.

CROESUS Motor Car Co., 216 E. 11th St., Kansas City, Mo.

DAIMLER Mfg. Co., 959 Steinway Ave., Long Island City, N. Y.

DAYTON Motor Car Co., Dayton, O. **(See page 13.)**

DEERE-Clark Motor Car Co., Moline, Ill.

DE LUXE Motor Car Co., Detroit, Mich.

DETROIT Auto Mfg. Co., 259 Willis Ave., E., Detroit, Mich.

DETROIT Auto Vehicle Co., 65-71 Catherine St., Detroit, Mich.

DIAMOND T Motor Car Co., Chicago, Ill.

DOLSON Automobile Co., Charlotte, Mich.

DORRIS Motor Car Co., 1211-1217 N. Vandewater Ave., St. Louis, Mo.

DRAGON Automobile Co., 30th and Chestnut Sts., Philadelphia, Pa.

EAGLE Automobile Co., Rahway, N. J.

EARL Motor Car Co., 615 Clybourne Ave., Milwaukee, Wis.

EASTON Machine Co., South Easton, Mass.

ECONOMY Motor Buggy Co., Fort Wayne, Ind.

ELECTRIC Vehicle Co. (The), Hartford, Conn.

ELMORE Mfg. Co., Clyde, O.

EUREKA Motor Co., Seattle, Wash.

EVANSVILLE Auto. Co., 5th and Locust Sts., Evansville, Ind.

EVERYBODY'S Motor Car Mfg. Co., St. Louis, Mo.

FEDERAL Automobile Co., Wentworth Ave. and 40th St., Chicago, Ill.

FEE Motor Car Co., Detroit, Mich.

FORD Motor Co., Piquette Ave. and Beaubien St., Detroit, Mich.

FOREST City Motor Car Co., Massillon, O.

FRANKLIN Mfg. Co., H. H., Syracuse, N. Y.

GAETH Auto Works, 900 Pearl St., Cleveland, O.

GEARLESS Transmission Co., German Insurance Bldg., Rochester, N. Y.

GOSHEN Motor Works, 9th St. and Lincoln Ave., Goshen, Ind.

GROUT Bros. Automobile Co., Orange, Mass.

HARPER Buggy Co., Columbia City, Ia.

HATFIELD Motor Vehicle Co., Miamisburg, O.

HAWLEY Automobile Co., Ltd., Constantine, Mich.

HAY-BERG Motor Car Co., Milwaukee, Wis.

HAYDOCK Automobile Mfg. Co., D. W., 1930 Chestnut St., St. Louis, Mo.

HAYNES Automobile Co. (The), Kokomo, Ind.

HEWITT Motor Co., 10 E. 31st St., N. Y. City.

HILL Motor Car Co., Haverhill, Mass.

HOLMES Motor Vehicle Co., East Boston, Mass.

HOLSMAN Auto Co., 608 Monadnock Block, Chicago, Ill. **(See page 13.)**

HUNTINGTON Automobile Co., Huntington, L. I., N. Y. **(See page 9.)**

IDEAL Runabout Mfg. Co., 105 Baynes St., Buffalo, N. Y.

INTERNATIONAL Harvester Co., Chicago, Ill.

IOWA Motor Car Co., Kellogg, Ia.

IROQUOIS Motor Car Co., Seneca Falls, N. Y.

JACKSON Automobile Co., Park Ave., Jackson, Mich.

JEFFERY, Thos. B. & Co., Kenosha, Wis.

JENKINS, J. W., 187 North Water St., Rochester, N. Y.

KERMATH Motor Car Co., Detroit, Mich.

KIBLINGER Co., W. H., Auburn, Ind.

KISSEL Motor Car Co., Hartford, Wis.

KLINK Motor Car Mfg. Co., Dansville, N. Y.

KNIGHT & Kilbourn, 1240 Michigan Ave., Chicago, Ill.

KNOX Automobile Co., Springfield, Mass.

KRUEGER Mfg. Co., 52-56 Biddle St., Milwaukee, Wis.

LA SALLE Niagara Auto Co., Niagara Falls, N. Y.

LEAR Auto Co., Oscar, 4th and Gay Sts., Columbus, O.

LEBANON Motor Works, Lebanon, Pa.

LENDE Automobile Mfg. Co., 407 Century Bldg., Minneapolis, Minn.

LINCOLN Automobile Co., Lincoln, Ill.

LEHR Agricultural Co., Fremont, O.

LOCOMOBILE Co. of America (The), Seaside Park, Bridgeport, Conn.

LOGAN Construction Co., Chillicothe, O.

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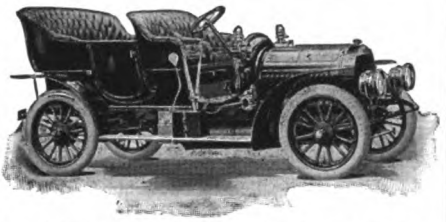

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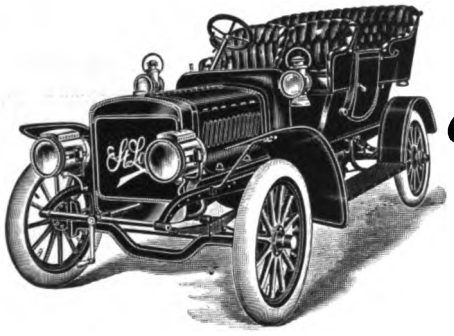

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MARVEL Motor Car Co., 284-290 Rivard St., Detroit, Mich.

MASON Motor Car Co., E. 5th and Vine Sts., Des Moines, Ia.

MATHESON Motor Car Co., Wilkes-Barre, Pa.

MATTHEWS Motor Co., Camden, N. J.

MAXWELL-Briscoe Motor Co., Tarrytown, N. Y.

MED-Bow Auto Co., Springfield, Mass.

MENGES Motor Car Co., 16-18 Mill St., Grand Rapids, Mich.

METEOR Automobile Works (The), Bettendorf, Ia.

MITCHELL Motor Car Co., Racine, Wis.

MODEL Automobile Co., Peru, Ind.

MODERN Tool Co., 4th and State Sts., Erie, Pa.

MOLINE Auto Co., E. Moline, Ill.

MOLINE Pump Co., Moline, Ill.

MONARCH Motor Car Co., 404 Monadnock Block, Chicago, Ill.

MONSEN, A., 57 Maple St., Chicago, Ill.

MOON Motor Car Co., 2d and Cornelia Sts., St. Louis, Mo.

MOORE Auto Co., 571 5th Ave., N. Y. City.

MORA Motor Car Co., Newark, N. Y.

MOTORCAR Co. (The), Detroit, Mich.

NAPIER Motor Car Co. of Amer., Boston, Mass.

NATIONAL Motor Vehicle Co., 2100 E. 22d St., Indianapolis, Ind.

NEILSEN Motor Car Co., Detroit, Mich.

NORDYKE & Marmon Co., Indianapolis, Ind.

NORTHERN Motor Car Co., 1090 Champlain St., Detroit, Mich.

OKEY Motor Car Co. (The), 9 Kimball St., Columbus, O.

OLDS Motor Works, Lansing, Mich.

OVERLAND Automobile Co., Standard Ave. and Division St., Indianapolis, Ind.

PACKARD Motor Car Co., Detroit, Mich.

PAGE Gas Engine Co., Adrian, Mich.

PAGE Motor Vehicle Co. (The), Providence, R. I.

PEERLESS Motor Car Co. (The), Lisbon, St., Cleveland, O.

PENNSYLVANIA Auto Motor Co., Bryn Mawr, Pa.

PERFECTION Automobile Works, South Bend, Ind.

PIERCE Engine Co., Racine, Wis.

PIERCE Co., The Geo. N., Buffalo, N. Y.

POPE Mfg. Co., Hartford, Conn.

POPE Mfg. Co., Hagerstown, Md.

POPE Motor Car Co., Toledo, O.

POSTAL Auto & Engine Co., Bedford, Ind.

PRACTICAL Automobile Co., Genoa, Ill.

PREMIER Motor Mfg. Co., Indianapolis, Ind.

PULLMAN Motor Car Co., 1106 Tacoma Bldg., Chicago, Ill.

PULLMAN Motor Vehicle Co., Fisher Bldg., Chicago, Ill.

RAINER Co. (The), Saginaw, Mich.

RANGER Motor Works, 4515 Evans Ave., Chicago, Ill.

RELIABLE Dayton Motor Car Co., 375 W. Lake St., Chicago, Ill.

REO Motor Car Co., Lansing, Mich.

ROSSLER Mfg. Co., C., Buffalo, N. Y.

ROYAL Motor Car Co. (The), Cleveland, O.
(See page 15.)

ST. LOUIS Car Co., 5200 N. 2d St., St. Louis, Mo.

ST. LOUIS Motor Car Co., Peoria, Ill.
(See page 15.)

SAMPSON Mfg. Co., Alden, Pittsfield, Mass.

SCHACHT Mfg. Co. (The), 2727 Spring Grove Ave., Cincinnati, O.

SCHNADER, Milton H., Reading, Pa.

SELDEN Motor Vehicle Co., Despatch, N. Y.

SHAWMUT Motor Co., Stoneham, Mass.

SHEFFIELD Car Co., Three Rivers, Mich.

SHOEMAKER Automobile Co., 88-90 Exchange St., Freeport, Ill.

SIMPLEX Motor Car Co., Mishawaka, Ind.

SINGLE Center Buggy Co., Evansville, Ind.

SMITH Auto Co., 618 Quincy St., Topeka, Kan.

SOMMER Motor Co., 152 Congress St. E., Detroit, Mich.

SPEEDWELL Motor Car Co., Dayton, O.

SPRINGFIELD Automobile Co., Springfield, Mass.

STANLEY Automobile Mfg. Co., Mooreland, Ind.

STAR Automobile Co., Plymouth Bldg., Chicago, Ill.

STAVER Carriage Co. (The), 76th and Wallace Sts., Chicago, Ill.

STEARNS Co., The F. B., Euclid and Lake View Aves., Cleveland, O.

STEEL-Swallow Auto Co., Jackson, Mich.

STEVENS Arms & Tool Co., J., Chicopee Falls, Mass.

STILSON Motor Car Co., 92 Renne Ave., Pittsfield, Mass.

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THOMAS-Detroit Co., E. R., Detroit, Mich.

THOMAS Motor Co., E. R., 1200 Niagara St., Buffalo, N. Y.

TINCHER Motor Car Co., 310-317 S. St. Joe St., South Bend, Ind.

TRIUMPH Motor Car Co., Cragin Station, Chicago, Ill.

TWYFORD Motor Car Co., Brookville, Pa.

VICTOR Automobile Mfg. Co., 171 Carroll St., St. Louis, Mo.

VICTORY Motor Car Co., San Jose, Cal.

WALTER Auto Co. (The), Whitehead Road, Trenton, N. J.

WALTHAM Mfg. Co., Waltham, Mass.

WASHINGTON Motor Car Co., Washington, Ind.

WAYNE Automobile Co., 129 Champlain St., Detroit, Mich.

WAYNE Works, Richmond, Ind.

WELCH Motor Car Co., Pontiac, Mich.

WESTERN Tool Works, Galesburg, Ill.

WILCOX Motor Car Co., H. E., 11th Ave. and Marshall St., N. E., Minneapolis, Minn.

WINTON Motor Carriage Co. (The), Berea Road, Cleveland, O.

WOODS Motor Vehicle Co., Chicago, Ill.

YORK Motor Car Co., Inc., York, Pa.

ZENT Auto Co., Bellefontaine, O.

GASOLINE COMMERCIAL VEHICLES

AMERICAN Foundry Co., Leipsic, O.

AMERICAN Machine Mfg. Co., 133-137 Beaubien St., Detroit, Mich.

AMERICAN Motor Truck Co., Lockport, N. Y.

AUTO-CAR Equipment Co., 77-79 Edward St., Buffalo, N. Y.

BARBER Asphalt Co., Philadelphia, Pa.

BUCKEYE Mfg. Co., Anderson, Ind.

BUFFALO Auto-Truck & Motor Co., 35 Mississippi St., Buffalo, N. Y.

CADILLAC Motor Car Co., Detroit, Mich.

CHASE Motor Truck Co., 232 E. Water St., Syracuse, N. Y.

COMMERCIAL Motor Car Co. (The), 4 E. 42d St., N. Y. City.

COMMERCIAL Motor Truck Co., Pine and Bell Sts., Plymouth, O.

COMMERCIAL Truck Co., Philadelphia, Pa.

COPPOCK Motor Car Co., Marion, Ind.

CORBIN Motor Vehicle Corporation, New Britain, Conn.

DAIMLER Mfg. Co., 959 Steinway Ave., Long Island City, N. Y.

DEERE-Clark Motor Car Co., Moline, Ill.

EMPIRE State Engineering Works, 555 E. 116th St., New York City.

FAIRBANKS, Morse & Co., Franklin and Monroe Sts., Chicago, Ill.

GAETH Automobile Works, 900 Pearl St., Cleveland, O.

HALSEY, Jas. T., 336 York Ave., Philadelphia, Pa.

HEWITT Motor Co., 10 E. 31st St., N. Y. City.

HINDE & Dauch, Sandusky, O.

HUBER Auto Co., 410 Fine Arts Bldg., Detroit, Mich.

IDEAL Mfg. Co., Portsmouth, O.

INDIANAPOLIS Automobile Co., Kentucky Ave., Indianapolis, Ind.

IROQUOIS Iron Works, Buffalo, N. Y.

JEFFERY & Co., Thos. B., Kenosha, Wis.

KANSAS City Motor Car Co., Sheffield Station, Kansas City, Mo.

KARBACH Automobile & Vehicle Co., Omaha, Neb.

KNOX Automobile Co., Springfield, Mass.

KNOX Motor Truck Co., Springfield, Mass.
(See page 235.)

LEAR Automobile Co., Oscar, Columbus, O.

LOGAN Construction Co., Chillicothe, O.

MACK Bros. Motor Car Co., Allentown, Pa.

MACNAUGHTAN Co., James, 29 W. 42d St., N. Y. City.

MARION Motor Car Co., Indianapolis, Ind.

MATHESON Motor Car Co., Wilkes-Barre, Pa.

MAXWELL-Briscoe Motor Co., Tarrytown, N. Y.

MEISELBACH Motor Wagon Co., A. D., North Milwaukee, Wis.

MICHIGAN Automobile Co., Ltd., Kalamazoo, Mich.
(See page 123.)

MILLER Motor Car Co., 554-558 Fairfield Ave., Bridgeport, Conn.

MITCHELL Motor Car Co., Racine, Wis.

MODEL Automobile Co., Peru, Ind.

MOTORCAR Co. (The), Detroit, Mich.

NEILSEN Motor Car Co., Detroit, Mich.

NORTHERN Motor Car Co., Detroit, Mich.

OLDS Motor Works, Lansing, Mich.

PACKARD Motor Car Co., Detroit, Mich.

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PONTIAC Motor Car Co., Pontiac, Mich.

POPE Mfg. Co., Hartford, Conn.

PREMIER Motor Mfg. Co., Indianapolis, Ind.

RAPID Motor Vehicle Co., Pontiac, Mich.

RELIANCE Motor Car Co., 67-99 Fort St., E., Detroit, Mich.

REO Motor Car Co., Lansing, Mich.

SAYERS & Scovill, 2247-2261 Colerain Ave., Cincinnati, O.

SEIBERT, The Shop of, 530-32 Ontario St., Toledo, O.

SHEFFIELD Car Co., Three Rivers, Mich.

SOULES Motor Car Co., Detroit, Mich.

STEVENS Arms & Tool Co., J., Chicopee Falls, Mass.

THOMAS Wagon Co. (The), Vernon, N. J.

TORBENSEN Motor Car Co., Bloomfield, N. J.

WESTERN Tool Works, Galesburg, Ill.

WHITMAN Agricultural Co., St. Louis, Mo.

WORTH Motor Car Mfg. Co., 219 Upper First St., Evansville, Ind.

ELECTRIC RUNABOUTS AND CARRIAGES

AMERICAN Electromobile Co., Detroit, Mich.

BABCOCK Electric Carriage Co., 226 W. Utica St., Buffalo, N. Y.

BAILEY & Co., Inc., S. R., Amesbury, Mass.

BAKER Motor Vehicle Co., 20 80th St., N. W., Cleveland, O.

BRUNN'S Carriage Manufactory, 1140-1148 Main St., Buffalo, N. Y.

BYRIDER Electric Mfg. Co., 1948-52 East 55th St., Cleveland, O.

CANTONO Electric Tractor Co., 111 West 37th St., N. Y. City.

COLUMBUS Buggy Co., Columbus, O.

ELECTRIC Vehicle Co. (The), Hartford, Conn.

ELECTRIC Vehicle Equipment Co., 20th St. and Montgomery Ave., Philadelphia, Pa.

FRITCHLE, Oliver P., 1449 Clarkson St., Denver, Col.

GENERAL Vehicle Co., Borden and Review Aves., Long Island City, N. Y.

HOLSON Motor Patents Co., Ltd., 405 Pythian Temple, Grand Rapids, Mich.

LANSDEN Co. (The), 54 Lackawanna Ave., Newark, N. J.

NATIONAL Motor Vehicle Co., 2100 E. 22nd St., Indianapolis, Ind.

PARSONS Electric Motor Carriage Co., Cleveland, O.

POPE Motor Car Co., Indianapolis, Ind.

RAUCH & Lang Carriage Co., 2180 W. 25th St., Cleveland, O.

STUDEBAKER Automobile Co., South Bend, Ind.

SYNNESTVEDT Machine Co., 4117 Liberty Ave., Pittsburgh, Pa.

WOODS Motor Vehicle Co., Chicago, Ill.

ELECTRIC COMMERCIAL VEHICLES

AMERICAN Electromobile Co., Detroit, Mich.

AUTO-CAR Equipment Co., Inc., 77-79 Edward St., Buffalo, N. Y.

CANTONO Electric Tractor Co., 111 W. 37th St., New York.

CHAMPION Wagon Co., Owego, N. Y.

COUPLE-Gear Freight-Wheel Co., 404-406 Ashton Bldg., Grand Rapids, Mich.

ELECTRIC Vehicle Co. (The), Hartford, Conn.

ELWELL-Parker Electric Co., 1076 Hamilton St., Cleveland, O.

GENERAL Vehicle Co., Borden and Review Aves., Long Island City, N. Y.

HOLSON Motor Patents Co., Ltd., 405 Pythian Temple, Grand Rapids, Mich.

LANSDEN Co. (The), 54 Lackawanna Ave., Newark, N. J.

McCREA Motor Truck Co. (The), Am. Trust Bldg., Cleveland, O.

McNAUGHTON Co., James, 29 W. 42d St., N. Y. City.

PITTSBURG Motor Vehicle Co., Pittsburg, Pa.

POPE Motor Car Co., Indianapolis, Ind.

STUDEBAKER Automobile Co., South Bend, Ind.

SYNNESTVEDT Machine Co., 4117 Liberty Ave., Pittsburgh, Pa.

STEAM PLEASURE VEHICLES

CLARK, Edward S., 272 Freeport St., Boston, Mass.

ESSEX Motor Car Co., 60 State St., Boston, Mass.

JAY Motor Co., Webb, 2335-39 State St., Chicago, Ill.

JOHNSON Service Co., 149-153 Michigan St., Milwaukee, Wis.

LANE Motor Vehicle Co., Poughkeepsie, N.Y.

MICHIGAN Steam Motor Co., Pontiac, Mich.

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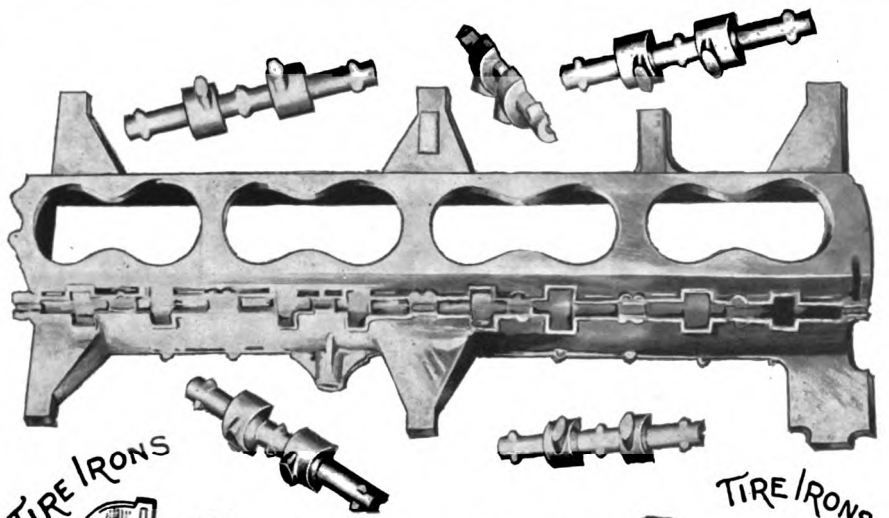

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TERWILLIGER & Co., Wm. B., 32 Division St., Amsterdam, N. Y.

TWOMBLY Motor Carriage Co., 52 Broadway, N. Y. City.

WHITE Co. (The), Rose Bldg., Cleveland, O.

STEAM COMMERCIAL VEHICLES

AMERICAN-Coulthard Co., Peabody, Mass.

COLUMBIA Engineering Works, William and Emlay Sts., Brooklyn, N. Y.

COMMERCIAL Truck & Power Co., 171 Main St., Rahway, N. J.

JOHNSON Service Co., 149-153 Michigan St., Milwaukee, Wis.

MICHIGAN Steam Motor Co., Pontiac, Mich.

PITTSBURGH Machine & Tool Co., Larock and Darrah Sts., Allegheny, Pa.

TRACTOR Co. (The), 3rd and Trumbull Sts., Elizabethport, N. J.

WHITE Co. (The), Rose Bldg., Cleveland, O.

MOTOR BOATS

ACKER, H., Tottenville, Staten Island.

AMERICAN Boat & Machine Co., 3517 So. 2d St., St. Louis, Mo.

AMERICAN Dynamic Co., Port Richmond, N. Y.

AMERICAN Yacht & Motor Co., Cherokee and DeKalb Sts., St. Louis, Mo.

ATLANTIC Co. (The), Amesbury, Mass.

AUTO Boat Co., West Mystic, Conn.

AYERS & Son, A., Nyack, N. Y.

BAY Ridge Launch Works, foot 39th St., Brooklyn, N. Y.

BEERS Bros. Engine Co., Culver Road, Rochester, N. Y.

BELLOWS, M. S., Chateaugay Lake, N. Y.

BENTER, Worth S., Catskill, N. Y.

BROOKS Boat Mfg. Co., Saginaw, Mich.

BURGESS & Packard, Board of Trade Bldg., Boston, Mass.

CHURCH Motor & Launch Co., 62 William St., New York City.

DeMOOY Bros., 765-67 Willson Ave., Cleveland, O.

DETROIT River Boat & Oar Co. (The), foot of Eureka Ave., Wyandotte, Mich.

DUPLEX Roller Bushing Co., Belfast, Me.

DUTTON Engineering Co., Perth Amboy, N. J.

ECHO Company, Young and Delaware Sts., Tonawanda, N. Y.

ELECTRIC Launch Co. (The), Bayonne, N. J.

EMMONS Co., E. Gerry, Swampscott, Mass.

FAIRBANKS-Grant Mfg. Co., Ithaca, N. Y.

FAY & Bowen Engine Co., 92 Lake St., Geneva, N. Y.

FRASER Hollow Spar & Boat Co., Greenport, L. I.

GAS Engine & Power Co., and Chas. L. Seabury Co., Morris Heights, N. Y. City.

GERE Launch & Engine Works, 234 Palisade Ave., Yonkers, N. Y.

GLOBE Iron Works, Menomonie, Wis.

GRAY Motor Co., Lieb and Larned Sts., Detroit, Mich.

HANKSCRAFT Co., Madison, Wis.

HENERHOFF Mfg. Co., Bristol, R. I.

HEPBURN, J. W., Toledo, O.

HOFFMAN Launch & Motor Works, W., 1253 N. Halsted St., Chicago, Ill.

HOLMES Motor Co., West Mystic, Conn.

HUNTINGTON Mfg. Co., New Rochelle, N. Y.

ISHAM Co., Norwich, Conn.

JACOB, R., City Island, N. Y.

JONES & Laborde, Oshkosh, Wis.

KIDNEY & Son, Dan, West DePere, Wis.

LAKE Shore Engine Works, Marquette, Mich.

LATHROP, J. W., Mystic, Conn.

LAWLEY & Son Corp., Geo., 696 E. 1st St., South Boston, Mass.

LEGARE, J. L., Ogdensburg, N. Y.

LEIGHTON, H. J., 901 W. Fayette St., Syracuse, N. Y.

LOZIER Motor Co. (The), Broadway and 55th St., New York City.

MATHER Corporation, The C. B., 56 Merrimac St., Newburyport, Mass.

MATTHEWS Boat Co., Port Clinton, O.

MEDART, Fred, St. Louis, Mo.

MICHIGAN Steel Boat Co., 1252 Jefferson Ave., Detroit, Mich.

MILTON Point Shipyard, Rye, N. Y.

MILTON & Son, T. M., Brewerton, N. Y.

MINNESOTA Boat & Power Works, Stillwater, Minn.

MULLINS Co., The W. H., 124 Franklin St., Salem, O.

MURRAY & Tregurtha Co., 340 W. First St., Boston, Mass.

NEW York Kerosene Oil Engine Co., 31 Burling Slip, N. Y. City.

NEW YORK Yacht, Launch & Engine Co., Morris Heights, N. Y. City.

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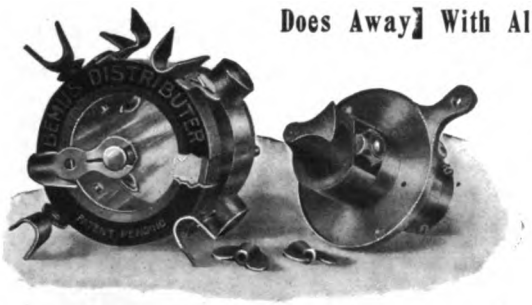

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NOCK, F. S., East Greenwich, R. I.

NORWALK Launch Co., Norwalk, Conn.

OSHKOSH Boat Works, Broad and River Sts., Oshkosh, Wis.

OUTING Boat Co., Kankakee, Ill.

PALMER Bros., Coscob, Conn.

PELTON Gasoline Engine Works, Lyons, Ia.

PERKINS Launch & Motor Co., Gloucester, Mass.

PIERCE Engine Co., Racine, Wis.

PIERSON Boat Construction Co., Duluth, Minn.

RACINE Boat Co., 1201 16th St., Racine, Wis.

RACINE Boat Mfg. Co., Muskegon, Mich.

RED Wing Boat Mfg. Co., Red Wing, Minn.

ROCHESTER Gas Engine Co., 705 Driving Park Ave., Rochester, N. Y.

SEITZ Co., F. A., 141 Frelinghuysen Ave., Newark, N. J.

STANDARD Motor Construction Co., 172 Whiton St., Jersey City, N. J.

ST. PAUL Boat Co., St. Paul, Minn.

STEARNS & McKay, Marblehead, Mass.

THOUSAND Island Boat & Engine Co., Morristown, N. Y.

TOLEDO Motor Boat & Power Co., Foot of Washington St., Toledo, O.

TOPPAN Boat Mfg. Co., 9 Haverhill St., Boston, Mass.

TOQUET Launch & Motor Co., Saugatuck, Conn.

TRUSCOTT Boat Mfg. Co., St. Joseph, Mich.

TUTTLE Co., D. M., Canastota, N. Y.

WILLIAMS-Whittlesey Co., Steinway, Long Island City, N. Y.

WOOD, B. F., City Island, N. Y.

WRIGHT, U. G., Paulsboro, N. J.

YACHT, Launch & Engine Co., Philadelphia, Pa.

MOTORCYCLES

AMERICAN Motor Co., 705 Centre St., Brockton, Mass.

ARMAC Motor Co., 472-478 Carroll Ave., Chicago, Ill.

AURORA Automatic Machinery Co., 421 Claim St., Aurora, Ill.

BRADLEY Motor Co., C. E., 268 Diamond St., Philadelphia, Pa.

BROWN & Beck, Denver, Colo.

BUCKEYE Motor Co., 201 So. High St., Columbus, O.

CONSOLIDATED Mfg. Co., Toledo, O. **(See page 73.)**

CROUCH Motor Co., Stoneham, Mass.

CURTISS Mfg. Co., G. H., Hammondsport, N. Y.

DUSENBERG, A. S., Garner, Iowa.

FOWLER-Manson-Sherman Cycle Mfg. Co., 45-47 Fulton St., Chicago, Ill.

GEER Co., Harry R., St. Louis, Mo.

GREAT Western Mfg. Co., La Porte, Ind.

HARLEY-Davidson Motor Co., Milwaukee, Wis.

HENDEE Mfg. Co., 837 State St., Springfield, Mass.

HOFFMAN Launch & Motor Works, W., 1253 N. Halsted St., Chicago, Ill.

HORNECKER Motor Mfg. Co., Whiting, Ind.

HUDSON Mfg. Co., Hudson, Mich.

ILLINOIS Motor Works, 719-23 Sheffield Ave., Chicago, Ill.

MAYO Damper Co., 355 Walnut St., Pottstown, Pa.

MEADOWBROOK Cycle Co., 137-141 Jackson St., Hempstead, L. I., N. Y.

MERKEL Motor Co., 1095 26th Ave., Milwaukee, Wis.

METZ, C. H., Waltham, Mass.

MIAMI Cycle & Mfg. Co., Grand Ave., Middletown, O.

MOTORCYCLE Equipment & Supply Co., 4 Lake St., Hammondsport, N. Y.

OVINGTON Mfg. Co., 2382 Broadway, N. Y. City.

PHILLIPS & Hamilton, Bradford, Pa.

PIONEER Motor Cycle Co., 290 Grove St., Jersey City, N. J.

POPE Mfg. Co., Hartford, Conn. **(See page 95.)**

PROSPECT Motor Mfg. Co., 7-9 Park Place, Brooklyn, N. Y.

READING Standard Cycle Mfg. Co., Reading, Pa.

RELIANCE Motor Cycle Co., Addison, N. Y.

ROYAL Motor Works, 38 Bloomingdale Road, Worcester, Mass.

STEFFEY Mfg. Co., 2941 Girard Ave., Philadelphia, Pa.

THEIM Mfg. Co., 38th St. and University Ave., N. E., Minneapolis, Minn.

THOMAS Auto-Bi Co., 1443 Niagara St., Buffalo, N. Y.

WAGNER Motor Cycle Co., 327 St. Peter St., St. Paul, Minn.

WALTHAM Mfg. Co., Waltham, Mass.

WARWICK Cycle & Auto Co., Springfield, Mass.

WESTERN Launch & Engine Works, Michigan City, Ind.

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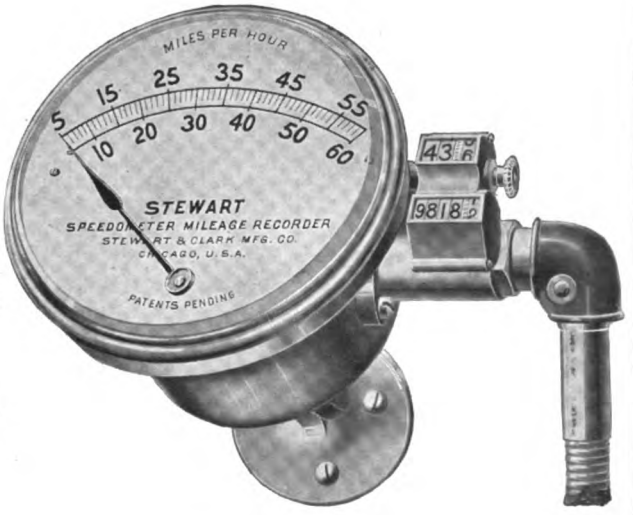

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ACCESSORIES

(Dealers and Jobbers)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill.
(See page 103.)

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich.
(See page 191.)

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill.
(See page 87.)

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill.
(See page 69.)

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill.
(See page 71.)

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill.
(See page 77.)

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill.
(See page 101.)

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City.
(See page 239.)

NEUSTADT Auto & Supply Co., St. Louis, Mo.
(See page 99.)

NEW York Sporting Goods Co., 17 Warren St., New York.
(See page 205.)

POPE Mfg. Co., Hartford, Conn.
(See page 95.)

ALCOHOL (Denatured)

GRAY & Co., Wm. S., 76 William St., N. Y. City.

UNITED States Industrial Alcohol Co., 100 William St., N. Y. City.

WEBB & Son, James A., 50-52 Stone St., N. Y. City.

ALUMINUM

ALLYNE Brass Fdry Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y.
(See page 55.)

ALUMINUM Company of America, Pittsburg, Pa.

ALUMINUM Foundry Co., Manitowoc, Wis.

BRIDGEPORT Deoxidized Bronze & Metal Co., Bridgeport, Conn.

BUCKEYE Iron & Brass Works, 324 E. Third St., Dayton, O.

CLUM & Atkinson, 575 Lyell Ave., Rochester, N. Y.

ELECTRIC Smelting & Aluminum Co. (The), Lockport, N. Y.

ENTERPRISE Foundry Co., Detroit, Mich.

GERSON-Carey Co., Kalamazoo St., and L. S. Ry., Lansing, Mich.

IMPERIAL Brass Mfg. Co., 257 S. Clinton St., Chicago, Ill.

KEYSTONE Brass Foundry Co., 188 Berks St., Philadelphia, Pa.

LIGHT Mfg. & Fdry. Co., Union and Queen Sts., Pottstown, Pa.
(See page 85.)

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 11.)

NEW JERSEY Aluminum Co., 701 Springfield Ave., Newark, N. J.
(See page 21.)

NIAGARA Falls Brass Works, Inc., Niagara and Virginia Sts., Buffalo, N. Y.
(See page 57.)

OBERDORFER Brass Co., M. L., 804 E. Water St., Syracuse, N. Y.

PIONEER Brass Works, 424 S. Penna. St., Indianapolis, Ind.

SYRACUSE Aluminum & Bronze Co., 530 Leavenworth Ave., Syracuse, N. Y.
(See page opposite and 53.)

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(See Solder, Aluminum)

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AMERICAN Electrical Novelty & Mfg. Co., 308 Hudson St., New York.

CONNECTICUT Telephone & Electric Co., Inc., Meriden, Conn.

DOW Portable Electric Co. (The), Braintree, Mass.

EASTERN Carbon Works, W. Bergen St., Jersey City, N. J.

ELDREDGE Electric Mfg. Co., 7 Post Office Square, Springfield, Mass.

GEEN Electrical Mfg. Co., Inc., 180 E. Lake St., Chicago, Ill.

GENERAL Electric Co., Schenectady, N. Y.

KENT Mfg. Works, Atwater, 50 N. 6th St., Philadelphia, Pa.
(See page 115.)

KEYSTONE Electrical Instrument Co., 9th St. and Montgomery Ave., Philadelphia, Pa.

KNOBLOCK-Heideman Mfg. Co., South Bend, Ind.

MONARCH Instrument Co. (The), Cleveland, O.

NATIONAL Carbon Co., Cleveland, O.
(See page 33.)

NEVER-MISS Spark Plug Co., Lansing, Mich.
(See page 115.)

NORTON Electrical Instrument Co., Manchester, N. H.

PIGNOLET, Louis M., 78 Cortlandt St., New York, N. Y.

POCKET Meter Co., Bluffton, O.

QUEEN & Co., Inc., 8th and Arch Sts., Philadelphia, Pa.

ROBERT Instrument Co., 49 Shelby St., Detroit, Mich.
(See page opposite.)

S. E. I. Co., Syracuse, N. Y.

STACKPOLE Battery Co., St. Mary's, Pa.

STANLEY Electric Mfg. Co., Pittsfield, Mass.

STERLING Mfg. Co., American Trust Bldg., Cleveland, O.

TALMONT Electric Engineering Co., 88-90 Centre St., N. Y. City.

WAGNER Electrical Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

WESTERN Electric Co., 259 So. Clinton St., Chicago.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 119.)

WESTON Electrical Instrument Co., Waverly Park, Newark, N. J.

WHITNEY Electrical Instrument Co., Concord, N. H.

WILLIAMS, E. Q., 531 So. Clinton St., Syracuse, N. Y.

ANNUNCIATORS

CHICAGO Battery Co., 14th St. and Michigan Ave., Chicago, Ill.
(See page 241.)

COWLES & Co., C., Water and Chestnut Sts., New Haven, Conn.

ELECTRIC Signs & Signals Co., 177 1-2 E. 87th St., N. Y. City.
(See page opposite.)

JESEPH & Co., W. R., 499 Clinton St., Buffalo, N. Y.

JONES Speedometer Co., New Rochelle, N. Y.

ANTI-FREEZING SOLUTIONS

ALGER Laboratories, Providence, R. I.

AUTO Chemical & Mfg. Co., 1770 Broadway, New York, N. Y.

BERINGER, Geo. N., 5th and Federal Sts., Camden, N. J.

CARBONDALE Chemical Co., Carbondale, Pa.

KALBFLEISCH Co., Franklin H., 16th St. and Broadway, N. Y. City.
(See page 75.)

MARX & Rawolle, 98 William St., N. Y. City.

YOUNG, Orlando W., 180 Freilinghuysen Ave., Newark, N. J.
(See page 141.)

ANTI-SKID DEVICES

ADWEAR Auto Tire Sleeve Co., High and Washington Sts., North Attleboro, Mass.

AKRON Pneumatic Tire & Protector Co., Akron, O.

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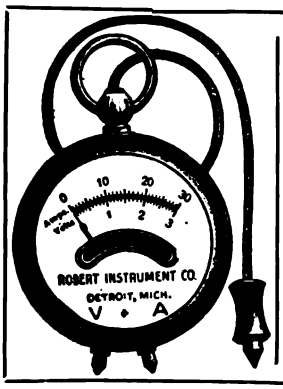

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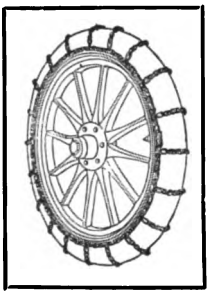

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DAVEY Tire Guard Co. (The), 399 Franklin St., Buffalo, N. Y.

HEALY Leather Tire Co., 88-90 Gold St., N. Y. City
(See page 181.)

INNER Shoe Tire Co., 64 Monroe St., Grand Rapids, Mich.

JOHNSON Sporting Goods Co., Iver, 163-165 Washington St., Boston, Mass.

LEATHER Tire Goods Co., Newton Upper Fals, Mass.
(See page 181.)

MARTIN-Evans Co., 1186 Bedford Ave., Brooklyn, N. Y.

MESINGER Mfg. Co., H. & F., 1801 First Ave., N. Y. City.

REPUBLIC Rubber Tire & Shoe Co. (The), 449 W. 53d St., N. Y. City.

SAGER Co., J. H., 265 South Ave., Rochester, N. Y.

SAMSON Leather Tire Co., 1634-1642 Broadway, N. Y. City.
(See page 183.)

S. C. FABRIC Tire Tread Co., 1900 Broadway, N. Y. City.

SLAMA Tire Protector Co., Humboldt, Neb.

SUNBURY Mfg. Co., Sunbury, O.

WEED Chain Tire Grip Co., 28 Moore St., N. Y. City.
(See page 29.)

WELLS Light Mfg. Co., 44-46 Washington St., N. Y. City.

APRONS AND CURTAINS

(Storm)

ANDERSON & Co., F. W., 729 So. Broad St., Philadelphia, Pa.
(See page 189.)

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich.
(See page 191.)

AUTO Top Co., 209 E. Columbia St., Fort Wayne, Ind.
(See page 235.)

CRAY Bros., 1244 9th St., N. W., Cleveland, O.

CURTAIN Supply Co. (The), 85-93 Ohio St., Chicago, Ill.

DETROIT Motor Car Supply Co., 1250 Jefferson Ave., Detroit, Mich.

ENEAS, A. G., 50 Congress St., Boston, Mass.

GILBERT Mfg. Co., New Haven, Conn.
(See page opposite.)

KROH Mfg. Co., The C. Z., Toledo, O.

MOTOR Top Co. of New York, 216 W. 50th St., N. Y. City.

NATHAN Novelty Mfg. Co., 88-90 Reade St., N. Y. City.

NATIONAL India Rubber Co., Bristol, R. I.

NEWTON & Son, W. H., Cortland, N. Y.

PERFECTION Storm Shield Co., Clyde, O.

RACINE Novelty Mfg. Co., 15th and Clark Sts., Racine, Wis.

SAFE Storm Shield Co., Fremont, O.

SPRAGUE Umbrella Co. (The), Norwalk, O.
(See page 247.)

VEHICLE Apron & Hood Co., Columbus, O.

VEHICLE Top and Supply Co., 902 Cass Ave., St. Louis, Mo.
(See page 191.)

WARNER Pole & Top Co., 1648 Central Ave., Cincinnati, O.

WILEY & Son Co., Wm. H., Hartford, Conn.

WOOD & Son, Fred'k R., 219 W. 19th St., New York City.

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ASBESTOS Mfg. Co., Philadelphia, Pa.

CAREY Mfg. Co., Philip (The), Lockland, O.

GILMORE Mfg. Co., R. M., 105 John St., N. Y. City.

JOHNS-Manville Co., H. W, 100 William St., N. Y. City

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NEW Jersey Asbestos Co., Camden, N. J.

NEW York Asbestos Mfg. Co., 80 John St., N. Y. City.

WATSON Co., H. F., Erie, Pa.

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(See Drop Forgings)

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AMERICAN Roller Bearing Co., So. Framingham, Mass.

ATLAS Drop Forge Co., Lansing, Mich.

BATES Forge Co., 227 Merrill St., Indianapolis, Ind.

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo.
(See page 177.)

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CITY Machine Co., 9-13 Orchard St., Detroit, Mich.

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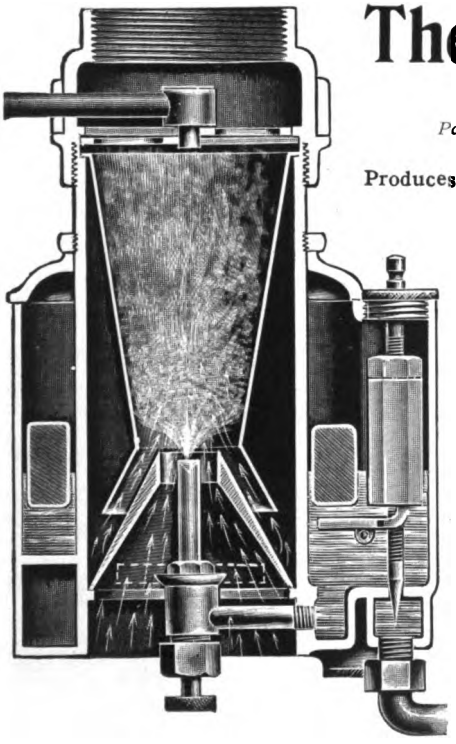

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DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapolis, Ind.
(See page 61.)

DIRECT Drive Axle Co. (The), 575 N. 4th St., Columbus, O.

FEDERAL Automobile Co., 40th St. and Wentworth Ave., Chicago, Ill.

FUNK Engineering Co., 39-45 14th St., Hoboken, N. J.

GARFORD Co. (The), Elyria, O.

GILL & Sons Forge & Machine Works, P. H., Brooklyn, N. Y.

HAYDEN Mfg. Co., The N. L., 172-82 W. Locust St., Columbus, O.

LEE & Porter Mfg. Co., Buchanan, Mich.

LEWIS Spring & Axle Co., Jackson, Mich.

LONG Arm System Co., Lakeside Ave. and 38th St., N. E., Cleveland, O.

NORTHWAY Motor & Mfg. Co., Maybury and Grand Aves., Detroit, Mich.

RICHMOND Forging Corporation, Richmond, Va.

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y.
(See page 207.)

SHELBY Steel Tube Co., 1714 Frick Bldg., Pittsburg, Pa.

SHELDON Axle Co., Wilkes-Barre, Pa.

SMITH Co., A. O., Milwaukee, Wis.

STANDARD Ball Axle Works, Lancaster, Pa.

STANDARD Roller Bearing Co., 48th St. and Girard Ave., Philadelphia, Pa.

TIMKEN Roller Bearing Axle Co., Canton, O.

WEBSTER Mfg. Co., 1075 West 15th St., Chicago, Ill.

WESTON-Mott Co., Flint, Mich.

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AMERICAN Ball-Bearing Co., Cleveland, O.

AMERICAN Ball Co., Eagle St. and Kingsley Ave., Providence, R. I.

BUFFALO Excelsior Machine Co., Military Road, Buffalo, N. Y.

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 231.)

JONES Co., E. J., Arlington Heights, Mass.

PRESSED Steel Mfg. Co., 454 The Bourse, Philadelphia, Pa.

STANDARD Roller Bearing Co., 48th St. and Girard Ave., Philadelphia, Pa.

BALL RETAINERS

BOSTON Pressed Metal Co., 171-73 Union St., Worcester, Mass.

CROSBY Co. (The), Buffalo, N. Y.
(See page 167.)

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

KONIGSLOW Mfg. Co., Otto, Cleveland, O.
(See page 49.)

SARTUS Ball Bearing Co., 155 Spring St., N. Y. City.

STAR Ball Retainer Co. (The), Lancaster, Pa.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

BASKETS, HAMPERS AND TOURING CASES (See Hampers)

BATTERY CONNFCTIONS (See Wire Terminals)

BATTERIES (Primary)

ALPHA Dry Battery Co., 28 Cortlandt St., New York.

AMERICAN Electrical Novelty & Mfg. Co., 308 Hudson St., N. Y. City.

CENTRAL Electric Mfg. Co., 1525 Second Ave., Rock Island, Ill.

COMMERCIAL Battery Co., 204-06 Michigan St., Chicago, Ill.

DAYTON Electrical Mfg. Co. (The), 87 St. Clair St., Dayton, O.
(See page 113.)

DELTA Mfg. Co., Bloomfield, N. J.

EASTERN Carbon Works, W. Bergen St., Jersey City, N. J.

EDISON Mfg. Co., Orange, N. J.

ELECTRIC Contract Co., 202 Centre St., N. Y. City.

ELECTRIC Storage Battery Co. (The), 19th St. and Allegheny Ave., Philadelphia, Pa.

ELKHRAT Dry Battery Co., Elkhart, Ind.

EMPIRE State Dry Battery Co., 70 Fulton St., N. Y. City.

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H. & H. Dry Battery Co., 842 E. Sample St., South Bend, Ind.

HOLCOMBE & Co., 45 Vesey St., N. Y. City.

LINCOLN Electric Co., 1-3 Union Sq., N. Y. City.

MANHATTAN Electrical Supply Co., 17 Park Place, N. Y. City.

NATIONAL Carbon Co., Cleveland, O. (See page 33.)

NOVELTY Electric Co., Philadelphia, Pa.

NUNGESSER Electric Battery Co. (The), 21 King St., Cleveland, O.

PHILADELPHIA Storage Battery Co., Emerald and Tioga Sts., Philadelphia, Pa.

ROCHE, Wm., 40 W. Broadway, N. Y. City.

ROCK Island Battery Co., Cincinnati, O.

SEMI-DRY Battery Co. (The), 5th and Essex Sts., Harrison, N. J.

STACKPOLE Battery Co., St. Marys, Pa.

VIVAX Storage Battery Co., 2228 Michigan Ave., Chicago, Ill. (See page opposite.)

WESCO Supply Co. (The), 7th St. and Clark Ave., St. Louis, Mo.

WESTERN Electric Co., 259 S. Clinton St., Chicago, Ill.

BATTERIES (Storage)

AMERICAN Battery Co., 170-172 South Clinton St., Chicago, Ill.

BATTERY Power Co., 247-253 Madison St., Milwaukee, Wis.

CHARTER & Co., 303 Dearborn St., Chicago, Ill.

CHICAGO Battery Co., Michigan Ave. and 14th St., Chicago, Ill. (See page 241.)

CLARK, A. F. & Co., 2130 W. Susquehanna Ave., Philadelphia, Pa.

COMMERCIAL Battery Co., 204-06 Michigan St., Chicago, Ill.

COMMERCIAL Storage Battery Co., 147 W. Jackson Blvd., Chicago, Ill.

DAYTON Electrical Mfg. Co. (The), 87 St. Clair St., Dayton, O. (See page 113.)

DAYTON Mfg. Co., 2240 E. 3d St., Dayton, O.

DELTA Mfg. Co., Bloomfield, N. J.

EDISON Storage Battery Co., Orange, N. J.

ELECTRIC Storage Battery Co. (The), Allegheny Ave. and 19th St., Philadelphia, Pa.

ELECTRIC Vehicle & Supply Co., 621 Grand Ave., Milwaukee, Wis.

EMPIRE Storage Battery Co., 42 E. 23d St., N. Y. City.

EVANSVILLE Battery & Electrical Co., Evansville, Ind.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers) (See page 77.)

GEIZLER Bros., 316 W. 42nd St., N. Y. City.

GENERAL Accumulator & Battery Co., 152 2d St., Milwaukee, Wis. (See page opposite.)

GOULD Storage Battery Co., 341-47 5th Ave., N. Y. City.

HANNA Storage Battery Co., McCordsville, Ind.

HASCHKE Compound Storage Battery Co. & Auto Buggy Works, 598 W. Monroe St., Chicago, Ill.

HATCH Accumulator Co., Charlestown, Boston, Mass.

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HENSEL Battery & Mfg. Co., Michigan Ave. and Eldredge Court, Chicago, Ill.

HERZ & Co., 203-205 Lafayette St., N. Y. City (Importers).

KITSEE Storage Battery Co. (The), Wilkes-Barre, Pa.

LOOK Electric Co., Inc. (The), 1545 Michigan Ave., Chicago, Ill.

MACRAE, Hector, 316 St. Paul St., Baltimore, Md.

MICHIGAN Storage Battery Co., 24 Atwater St., E., Detroit, Mich.

MULLER, Albert, 205 W. 41st St., N. Y. City.

NATIONAL Battery Co., 268-282 Massachusetts Ave., Buffalo, N. Y.

NATIONAL Motor Vehicle Co., 2100 E. 22d St., Indianapolis, Ind.

NEW England Motor Co., Liberty Square, Lowell, Mass.

NORTHWESTERN Storage Battery Co., 448 Milwaukee St., Milwaukee, Wis.

PERRETT Storage Battery Co., 17 State St., N. Y. City.

PHILADELPHIA Storage Battery Co., Emerald and Tioga Sts., Philadelphia, Pa.

PILE Bloc Co., 253 B'way, New York.

ROYAL Battery Co., 108-110 Duane St., N. Y. City. (See page 7.)

RUBAY, Leon, 1697 Broadway, N. Y. City (Importer).

RUPRECHT Electrical Co., 7117 Cedar Ave., Cleveland, O.

SCHUG Electric Mfg. Co., 336 Jefferson Ave., Detroit, Mich. (See page 173.)

SMITH Storage Battery Co., 198 State St., Binghamton, N. Y.

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TRAY Plate Battery Co. (The), 5 Frederick St., Binghamton, N. Y.

UNITED States Battery Co., New Rochelle, N. Y.

UNIVERSAL Electric Storage Battery Co., Stock Exchange Bldg., Chicago, Ill.

VESTA Accumulator Co., 1336 Michigan Ave., Chicago, Ill.

VIVAX Storage Battery Co., 2228 Michigan Ave., Chicago, Ill.
(See page 35.)

VOLTA Battery Co., 938 Monadnock Blk., Chicago, Ill.

WESTERN Storage Battery Co., E. 22d and Yandes Sts., Indianapolis, Ind.

WILLARD Storage Battery Co. (The), Cleveland, O.

WITHERBEE Igniter Co., 541 West 43d St., N. Y. City.
(See page opposite.)

WITHERBEE Mfg. Co., 433 W. 42d St., New York.

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AMERICAN Ball-Bearing Co., Edgewater Park and L. S. Ry., Cleveland, O.

AUBURN Ball Bearing Co., Rochester, N. Y.

BANTAM Anti-Friction Co., Bantam, Conn.

BRETZ Co., J. S. (Importer), Times Bldg., N. Y. City.

CHAPMAN Ball-Bearing Co., 40 Bristol St., Boston, Mass.

CRITCHLEY Machine Screw Co., 25 Union St., Worcester, Mass.

HESS-Bright Mfg. Co., 19th and Hamilton Sts., Philadelphia, Pa.

PENNSYLVANIA Ball & Roller Bearing Co., Girard, Pa.

PRESSED Steel Mfg. Co., 454 The Bourse, Philadelphia, Pa.

RUBAY, Leon, 1697 Broadway, N. Y. City (Importer).

SARTUS Ball Bearing Co., 155 Spring St., N. Y. City.

STANDARD Roller Bearing Co., 48th St. and Girard Ave., Philadelphia, Pa.

STAR Ball Bearing Axle Co., Princeton, Ill.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

BEARINGS (Roller)

AMERICAN Roller Bearing Co., South Framingham, Mass.

HYATT Roller Bearing Co., 427 Middlesex St., Harrison, N. J.

McKEEL & Co., Ltd., Geo. A., Jackson, Mich.

PENNSYLVANIA Ball & Roller Bearing Co., Girard, Pa.

STANDARD Roller Bearing Co., Girard Ave. and 48th St., Philadelphia, Pa.

TIMKEN Roller Bearing Axle Co., Canton, Ohio.

BELLS

ANSONIA Electrical Co., Ansonia, Conn.

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O.
(See page 223.)

BEVIN Bros. Mfg. Co., East Hampton, Conn.

BRIDGEPORT Brass Co., Bridgeport, Conn.

COLE & Son, Rockford, Ill.

EAST Hampton Bell Co. (The), East Hampton, Conn.

EDWARDS & Co., 405 E. 144th St., N. Y. City.

GEEN Electrical Mfg. Co., Inc., 180 E. Lake St., Chicago, Ill.

GONG Bell Mfg. Co., East Hampton, Conn.

HILL, N. N., Brass Co., East Hampton, Conn.

HOLTZER-Cabot Electric Co. (The), Brookline, Mass.

LIBERTY Bell Co., Bristol, Conn.

MANHATTAN Electrical Supply Co., 17 Park Place, N. Y. City.

MOSSBERG Co., Frank, Attleboro, Mass.

NEW Departure Mfg. Co., Bristol, Conn.

PROCTOR-Raymond Mfg. Co., Detroit, Mich.

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AMERICAN Belting Co., 135 Oliver St., Boston, Mass.

BROPHY Belting & Supply Co., La Grange, Ill.

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PHILADELPHIA Steel & Wire Co., 525 Commerce St., Philadelphia, Pa.

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(See page 75.)

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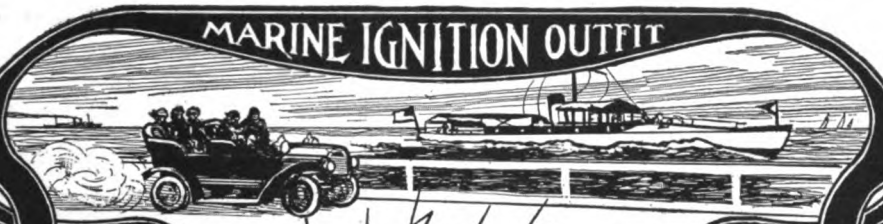

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AUTO Body Co. (The), Franklin Ave., Lansing, Mich.

AUTO Body & Finishing Co., Amesbury, Mass.

AUTO Equipment Co., 1424-26 Michigan Ave., Chicago, Ill.

A.-Z. Co. (The), 527 W. 56th St., N. Y. City.

BABCOCK Co., H. H., Watertown, N. Y.

BARNDT-Johnston Auto Supply Co. (The), 422 Donaldson St., Columbus, O. (See page opposite.)

BIDDLE & Smart Co., Amesbury, Mass. (See page 19.)

BLUE Ribbon Horse & Carriage Co., 130-170 Cannon St., Bridgeport, Conn.

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo. (See page 177.)

BORCHERS Tonneau Mfg. Co., Dayton, O.

BRIDGEPORT Vehicle Co., South Ave. and Main St., Bridgeport, Conn.

BRIGGS Carriage Co., Amesbury, Mass.

BROC Carriage & Wagon Co., 1665-67 40th St., N. E., Cleveland, O.

BRUNN'S Carriage Manufactory, 1140-48 Main St., Buffalo, N. Y.

BUFFALO Auto Body & Trimming Co., 338 Ellicott St., Buffalo, N. Y.

BUOB & Scheu, 408 E. Court St., Cincinnati, Ohio.

CARLISLE Body & Gear Wks., Carlisle, Pa.

CARRIAGE Woodstock Co., Owensboro, Ky.

CENTRAL Mfg. Co., Connersville, Ind.

CHICAGO Coach & Carriage Co., 1223 Michigan Ave., Chicago, Ill.

COLE & Woop, 48 W. 67th St., N. Y. City.

CONNOLLY Carriage Works, Thomas, 7th and Iowa Sts., Dubuque, Ia.

CRAWFORD, G. W. & H. D., Delhi, N. Y.

CURRIER-Cameron Co. (The), 85 Elm St., Amesbury, Mass.

DANN Bros. & Co. (The), 80-88 Franklin St., New Haven, Conn.

DAYTON Folding Tonneau Co., Dayton, O.

DEMOREST, A. L., New Haven, Conn.

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DETROIT Motor Car Supply Co., 1250 Jefferson Ave., Detroit, Mich.

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FICKLING & Co., Inc., 154 E. 57th St., New York City.

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FRANZ Body Mfg. Co. (The), Stanton Ave. and Getz St., Akron, O.

GOOLD, James Co., Albany, N. Y.

GRAVES & Congdon Co., Oak St., Amesbury, Mass.

HARTFORD Auto Body Works, 809 Asylum Ave., Hartford, Conn.

HAVENS Co. (The), Kokomo, Ind.

HAYES Mfg. Co., 360-370 Maybury Ave., Detroit, Mich. (See page 73.)

HEALY & Co., 1652 Broadway, N. Y. City.

HILL Mfg. Co., 25-27 Fuller St., Buffalo, N. Y.

HOLCOMB Co. (The), 105 Goffe St., New Haven, Conn.

HORTON, H. A., 127-131 Park St., New Haven, Conn.

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HUME Carriage Co., Amesbury, Mass. (See page 147.)

JACKSON Body Co., Jackson, Mich.

JUDKINS & Sons Co., J. B., Merrimac, Mass.

KALB & Berger Mfg. Co., Inc. (The), 530-32 72d St., N. Y. City.

KARBACH Automobile & Vehicle Co., Omaha, Neb.

KEYSTONE Wagon Wks. Co., Reading, Pa.

KILLAM, Henry, Chestnut and Wooster Sts., New Haven, Conn.

KIMBALL & Co., C. P., 315 Michigan Ave., Chicago, Ill. (See page 191.)

KOEN, James R., 1257 Niagara St., Buffalo, N. Y.

KUNDTZ, Theo., Winslow and Center Sts., Cleveland, O.

LANE, T. W., Amesbury, Mass.

LAPORTE Carriage Co., Laporte, Ind.

LAWRENCE & Co., L., Newark, N. J.

LEITCH Co., James N., Amesbury, Mass.

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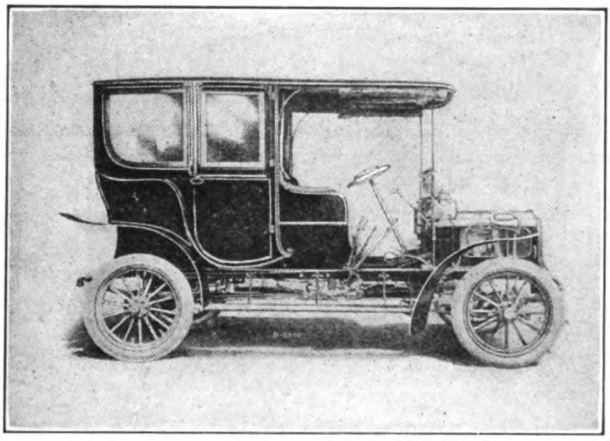

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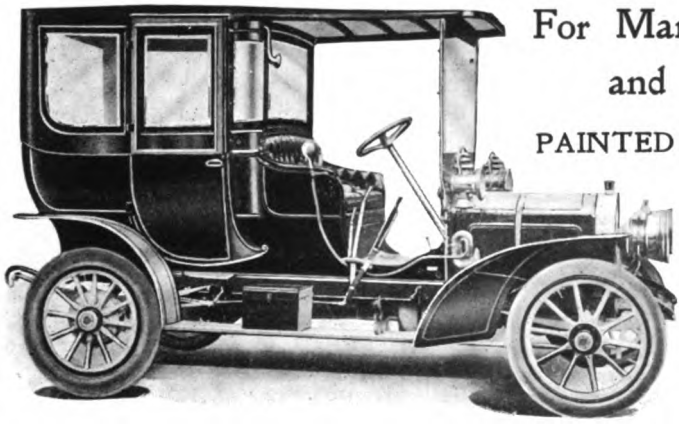

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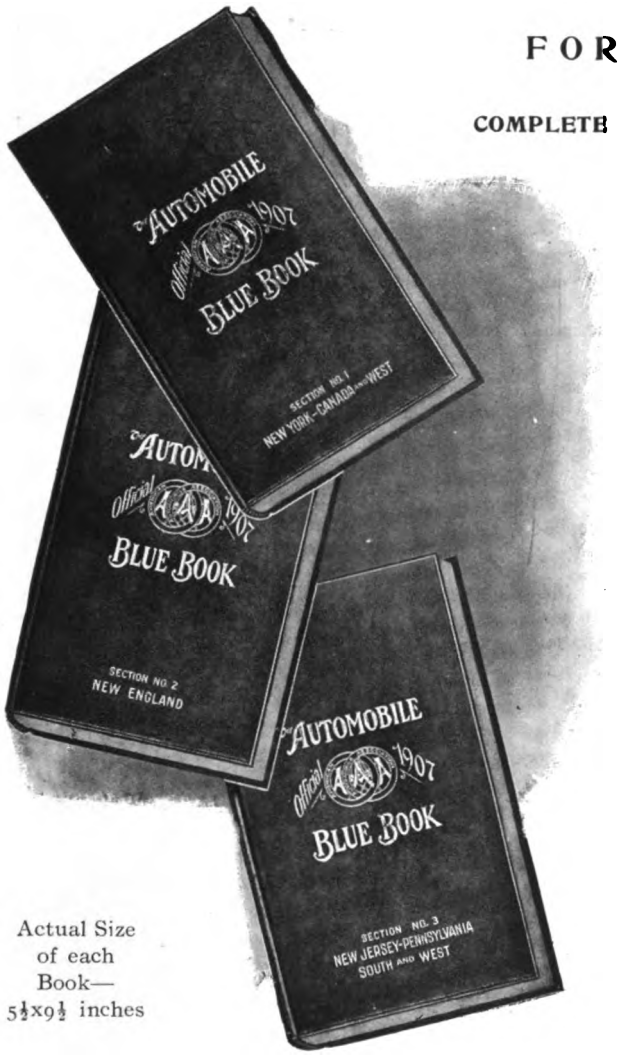

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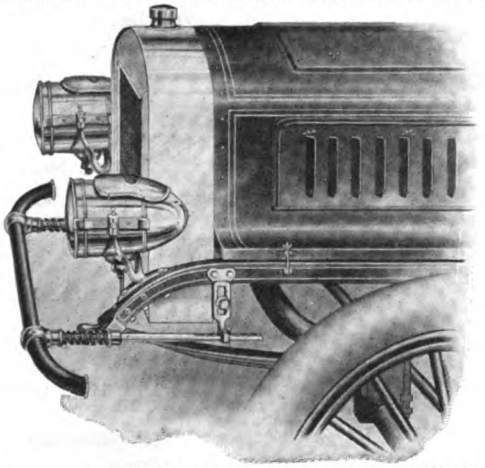

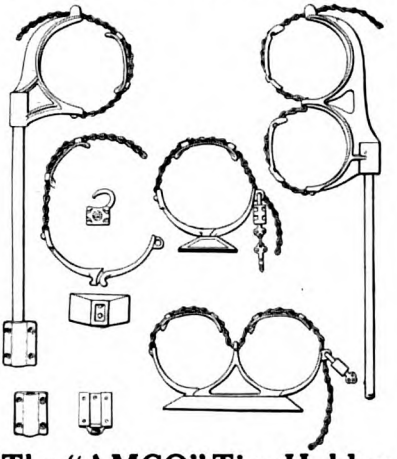

The "AMCO" Tire Holder

The only extra tire holder from which the tire can be released or put back in thirty seconds. Simple in construction, yet impossible to open without the key. The tire cannot jar loose even on the roughest going. The Holder (when not in use) can be detached from the car as quickly as the tire can be taken out of the holder. Ask your dealer to show you how easy the "AMCO" Tire Holder works.

Single Tire Holders (3 pieces), per set, $6.
Double Tire Holders (3 pieces), per set, $9.

APPLIANCE MFG. CO., 72-86 W. Jackson Boulevard, Chicago

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CRANE Co., W. N., 1131-1133 Broadway, N. Y. City.

KIRCHBERGER & Co., 50 Warren St., New York City.

NO-MATCH Electric Mfg. Co., 141 Milk St., Boston, Mass.

PREST-O-LITE Co. (The), 1904 Broadway, N. Y. City.
(See page 179.)

STEWART Mfg. Co., D. M., Chattanooga, Tenn.

CANOPIES
(See Tops)

CANS
(See Oil Cans)

CANS (Waste)

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J.
(See page 145.)

CLEVELAND Wire Spring Co., Hamilton and E. 38th St., Cleveland, O.

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

CAPS
(See Wearing Apparel)

CARBIDE

ACETYLENE Gas Ill. Co., 105 Walker St., New York.

ACETYVONE Co., Niagara Falls, N. Y.

AMERICAN Carbolite Co., Duluth, Minn.

NEW Amsterdam Motor Co., 152 W. 56th St., New York.

UNION Carbide Co., Michigan Ave. and Adams St., Chicago, Ill.

CARBURETER FLOATS (Ball)

GOODWIN & Kintz Co., Winsted, Conn.

HERCULES Float Works, 200 Franklin St., Springfield, Mass.

NAUGATUCK Mfg. Co., Naugatuck, Conn.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

CARBURETER FLOATS (Cork)

ARMSTRONG Cork Co., 23d St. and Railroad Ave., Pittsburg, Pa.

CARBURETERS

ACORN Brass Mfg. Co., Green, Fulton and Peoria Sts., Chicago, Ill.

AMERICAN Carburetor Co., 907 Michigan Ave., Detroit, Mich.

AMERICAN Motor Parts Co., 21-23-25 Plymouth Court, Chicago, Ill.
(See page 113.)

ASTER Co., 1591 Broadway, N. Y. City.

AURORA Automatic Machinery Co., 421 Claim St., Aurora, Ill.

AUTO Improvement Co., 316 Hudson St., New York City.

AXIOM Carbureter Mfg. Co. (The), 106 E. 28th St., N. Y. City.

BAIRD-Banks Mfg. & Supply Co., 203 Broadway, N. Y. City.

BOWERS Co., Inc., The F. E., New Haven, Conn.
(See page 31.)

BRADFORD Motor Works, Bradford, Pa.

BREEZE Carbureter Co., 276 Halsey St., Newark, N. J.

BROCK, A. A., 140 Dearborn St., Chicago, Ill.

BROOKLYN Coil & Carbureter Co., 77-79 Adams St., Brooklyn, N. Y.

BUFFALO Carburetor Co., Main and Carlton Sts., Buffalo, N. Y.
(See page opposite.)

BYRNE, Kingston & Co., Kokomo, Ind.

CAMDEN Anchor-Rockland Machine Co., Rockland, Me.

CHRISTOPHER Bros., 1049 Sheffield Ave., Chicago, Ill.

CLEMICK-Hirsch Co., 594 National Ave., Milwaukee, Wis.

CROSS Engine Co., M. O., 800-806 Bellevue Ave., Detroit, Mich.

CULVER Novelty Co., Culver, Ind.

CUSHMAN Motor Co., Lincoln, Neb.

DEMSTER Machinery Co., 16th and Walnut Sts., Kansas City, Mo.

DERBY Mfg. Co., Trenton, N. J.

DUPLEX Roller Bushing Co., Belfast, Me.

FAST, Otto, Greenfield and 25th Aves., Milwaukee, Wis.

GAITHER-Owen Co., 40 W. 60th St., N. Y. City.

GALVIN CO. (The), J. F., 74-78 Fort St., E., Detroit, Mich.

GENERATOR Valve Co., 294-96 Taaffe Place, Brooklyn, N. Y.

GOLDBERG Motor Car Devices Mfg. Co., 1253 Michigan Ave., Chicago, Ill.

GOULD-Derby Mfg. Co., 109 N. Broad St., Trenton, N. J.

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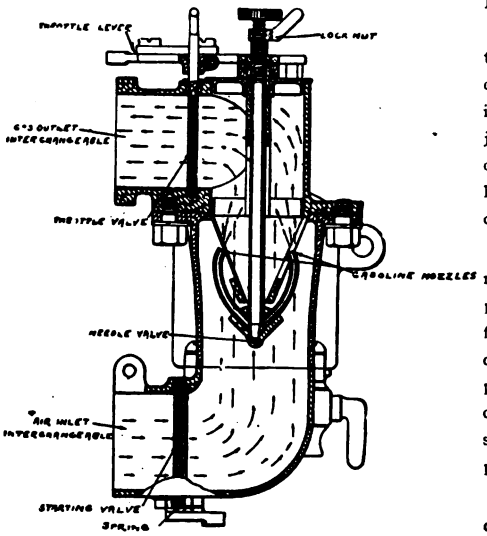
Mr. Manufacturer **Mr. Dealer**

YOU WANT **YOU NEED**

THE BUFFALO CARBURETOR

BECAUSE It saves you trouble, time and money. It is a mechanical Carburetor, Flexible, Reliable and Economical.



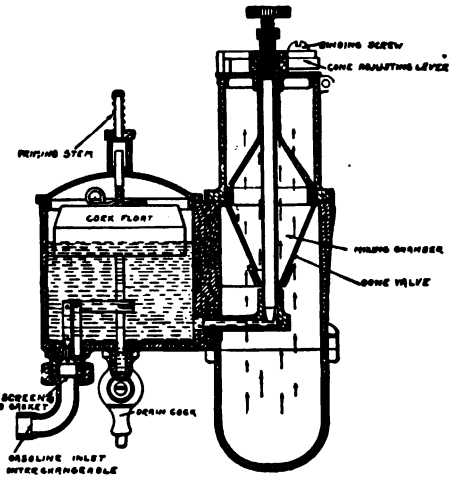
The **BUFFALO CARBURETOR** saves trouble because it gives complete mechanical control of the motor; it saves time because it has few parts; simple and permanent adjustments; it saves money because it produces greater horse-power per gallon of gasoline, and that means greater mileage, increasing the range of the Car.

The **BUFFALO CARBURETOR** varies the mixture to suit the conditions of load imposed. At the will of the operator greater flexibility cannot be obtained. It is devoid of springs, valves or other mechanism depending on atmospheric conditions for successful operation. All members are direct solid connections, giving the operator complete, positive control of his machine.

The BUFFALO CARBURETOR is the best on the market. It saves from 20 per cent. to 50 per cent. on gasoline consumption because its operation is based on scientific principles. The Ford six-cylinder car which won the 24-hour race in Detroit June 22nd, breaking all world's records, was equipped with a Buffalo Carburetor.

The "Haynes" Vanderbilt Cup Racer was equipped with a Buffalo. And all Thomas 1906 records were obtained with **BUFFALO CARBURETORS.**

The entering column of air passes the gasoline nozzle at adjustable openings in the cone valve. The cone valve and throttle are link-connected and move in unison, both are adjusted to give proper mixture for slow speed, as increased power or speed is desired. The cone valve and throttle are rotated by the operator increasing the quantity of mixture admitted, while the speed of the mixture passing the nozzles is kept the same. This feature insures a perfect mixture for all powers, prevents a greater quantity of fuel from being drawn by the motor than can be properly burned, and accounts for the great economy obtained with a 1908 mechanical Carburetor.



Write for full particulars and prices

THE BUFFALO CARBURETOR COMPANY

889 Main Street, Buffalo, N. Y.

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HAGAR Carburettor Co., 819-21 Broadway, Nashville, Tenn.

HALL Co., Chas. E., 108 Broadway, Buffalo, N. Y.
(See page 167.)

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

HEATH Dry Gas Co., 1937 Broadway, N. Y. City.

HEITGER Carbureter Co., 205-207 West South St., Indianapolis, Ind.
(See page 203.)

HOLLEY Bros. Co., 661-673 Beaubein St., Detroit, Mich.

IMPERIAL Brass Mfg. Co., 247 So. Jefferson St., Chicago, Ill.

JOHNSTON Machine Co., 86 High St., Woodbury, N. J.

KALAMAZOO Carbureter Co., 1301 Grand Ave., Kalamazoo, Mich.

KAUFMAN, Chas., 28 Main St., Oshkosh, Wis.

KNOBLOCK-Heideman Mfg. Co., South Bend, Ind.

LEE Mfg. Co. (The), Port Huron, Mich.

LIPMAN Mfg. Co. (The), 210 Pleasant St., Beloit, Wis.

LOOMIS Autocar Co., Westfield, Mass.

LUNKENHEIMER Co. (The), 213-223 E. 8th St., Cincinnati, O.

LUSTRE Chemical Co., 1303 Michigan Ave., Chicago, Ill.

MARVEL Mfg. Co., 15½ Virginia Ave., Indianapolis, Ind.

MAYO Damper Co., 355 Walnut St., Pottstown, Pa.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 11.)

NEWCOMB Carbureter Co., 1900 Broadway, N. Y. City.

NORTH Chicago Machine Co., North Chicago, Ill.

NUTTING Machine Co., Dayton, O.

PEERLESS Equipment Co., 170 S. Clinton St., Chicago, Ill.

Power Co., J. J., 606 Williamson St., Madison, Wis.

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill.
(See page 135.)

PUTNAM, R. H., 57 Lebanon St., Springfield, Mass.

SARIS, J. H., Beloit, Wis.

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

SINTZ, Guy L., Fulton and Front Sts., Grand Rapids, Mich.

SPEED Changing Pulley Co., 750 E. Washington St., Indianapolis, Ind.
(See page 65.)

STANDARD Carbureter Co., Inc., Sabin and Mathewson Sts., Providence, R. I.
(See page 97.)

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WHEELER & Schebler, Indianapolis, Ind.

WILLET Engine & Carbureter Co., 764 Ellicott Sq., Buffalo, N. Y.

WILLIAMS Valve Co., D. T., 521-23 Hunt St., Cincinnati, O.

WINKLEY Co. (The), 226 Abbott St., Detroit, Mich.

XARDELL Co., C. A., Utica, N. Y.

CASTINGS

(Brass, Bronze, Aluminum and Copper)

ALLEN Mfg. Co., W. D., 151 Lake St., Chicago, Ill.

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y.
(See page 55.)

ALUMINUM Foundry Co., Manitowoc, Wis.

AMERICAN Brass & Aluminum Works, Fulton and Walnut Sts., Indianapolis, Ind.

AMERICAN Brass Foundry Co., Hyde Park, Mass.

AMERICAN Castings Co., 809 Columbus S. & F. Bldg., Columbus, O.

AMERICAN Foundry & Mfg. Co., 11th and Herbert Sts., St. Louis, Mo.

AMERICAN Pin Co., Waterbury, Conn.

AMESBURY Brass & Foundry Co., Amesbury, Mass.
(See page 187.)

AURORA Motor Works, North Aurora, Ill.

BASTIAN Mfg. Co., Chas. L., 76 Illinois St., Chicago, Ill.

BLAKE, Edwin J., 565 Windsor St., Hartford, Conn.

BELFIELD & Co., H., 435 N. Broad St., Philadelphia, Pa.

BRIDGEPORT Deoxidized Bronze & Metal Co., Bridgeport, Conn.

BUCKEYE Iron & Brass Wks., 324 E. 3d St., Dayton, O.

CALDWELL Co. (The), 136 S. 4th St., Philadelphia, Pa.

CHICAGO Hardware Foundry Co., North Chicago, Ill.

CLARK, John W., Albany, N. Y.

CLUM & Atkinson, 575 Lyell Ave., Rochester, N. Y.

COLUMBUS Brass Co., Columbus, O.

DAY Foundry Co. (The), Illinois and Mary Sts., Buffalo, N. Y.
(See page 59.)

ELKHART Brass Mfg. Co., Prospect St., Elkhart, Ind.

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When it comes to

MANGANESE BRONZE CASTINGS

don't forget that this is one of our specialties. Our own alloy or Parsons; just as you say.

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Syracuse Aluminum & Bronze Company

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Syracuse, N. Y.

THOMAS J. WETZEL

Eastern Sales Agent

29 W. 42d STREET NEW YORK CITY

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CASTINGS (Brass, Bronze, Aluminum and Copper) (Continued)

ELM CITY Brass Co., New Haven, Conn.

ELYRIA Machine Parts Co. (The), Elyria, O.

ENTERPRISE Foundry Co., Detroit, Mich.

EUREKA Tempered Copper Works, Northeast, Pa.

FERRO Machine & Foundry Co. (The), 251 Wade Building, Cleveland, O. (See page 215.)

FOREST City Brass Wks., Cleveland, O.

GALVIN Co., The J. F., 74-78 Fort St., E., Detroit, Mich.

GAYLORD Co., F. L., 28 Pleasant St., Ansonia, Conn.

GERSON-Carey Co., Kalamazoo St. and L. S. Ry., Lansing, Mich.

GRAHAM, James & Co., 293 Wooster St., New Haven, Conn.

HEINDEL Mfg. Co., Hanover, Pa.

HENDRYX & Co., Andrew B., New Haven, Conn.

HERCULES Float Works, 200 Franklin St., Springfield, Mass.

HOFELLER Brass Foundry Co., 100 Terrace Buffalo, N. Y.

HOMER Brass Works, Inc., 231 Race St., Philadelphia, Pa.

HUB Foundry & Plating Co., Inc., Ossining, N. Y.

HUMPHREYS Mfg. Co., Mansfield, O.

IMPERIAL Brass Mfg. Co. (The), 251 So. Jefferson St., Chicago, Ill.

INDIANA Brass & Bronze Co., Marion, Ind.

JEFFERSON Brass Foundry, Brooklyn, N. Y.

KEYSTONE Brass Foundry Co., 188 Berks St., Philadelphia, Pa.

KOKOMO Brass Works, 351 N. Smith St., Kokomo, Ind.

LANGSENKAMP-Wheeler Brass Works (The), Shelby, Sander and Barth Aves., Indianapolis, Ind.

LIGHT Mfg. & Foundry Co., Union and Queen Sts., Pottstown, Pa. (See page 85.)

LUMEN Bearing Co., Lathrop St., Buffalo, N. Y. (See page 117.)

MANHATTAN Brass Co., 328 E. 28th St., N. Y. City.

MAYO Damper Co., 355 Walnut St., Pottstown, Pa.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (See page 11.)

MOORE Co., Franklin, Winsted, Conn.

NEW JERSEY Aluminum Co., 701 Springfield Ave., Newark, N. J. (See page 21.)

NIAGARA Falls Brass Wks., Inc., Niagara and Virginia Sts., Buffalo, N. Y. (See page 57.)

NOLTE Brass Co., Springfield, O.

NON-CORROSIVE Metal Co. (Inc.), Watertown, Conn.

NOONAN Tool & Machine Works, 105 E. Dow St., Rome, N. Y.

NORWALK Brass Co., Mechanic St., Norwalk, Conn.

OBERDORFER Brass Co., M. L., 804 East Water St., Syracuse, N. Y.

OHIO Brass Co., Mansfield, O.

PHOSPHOR Bronze Smelting Co., Ltd. (The), 2200 Washington Ave., Philadelphia, Pa.

PIONEER Brass Works, Indianapolis, Ind.

PITTSBURG Brass Mfg. Co., 3153 Penn Ave., Pittsburg, Pa.

POWOW Foundry, Amesbury, Mass.

PROVIDENCE Brass Foundry & Machine Co., 460 Eddy St., Providence, R. I.

RACINE Brass & Iron Co., Racine, Wis.

REEVES & Son, Paul S., 1415 Catherine St., Philadelphia, Pa.

RYAN & Co., J. J., 68-74 W. Monroe St., Chicago, Ill.

SHERWOOD Brass Works, 1167 Jefferson Ave., Detroit, Mich.

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

SPENCE Mfg. Co., 279 Park St., Milwaukee, Wis.

SPENCER'S Sons, I. S., Guilford, Conn.

STANDARD Foundry Co., Hartford, Conn.

STOVER Mfg. Co., Freeport, Ill.

SYRACUSE Aluminum & Bronze Co., 530 Leavenworth Ave., Syracuse, N. Y. (See pages 27 and 53.)

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (See page 83.)

UNIQUE Metal Co., 16-18-20 Elk St., Buffalo, N. Y.

UNITED States Aluminum Co., Pittsburg, Pa.

UNITED States Aluminum Castings Co., Hamilton and Vandalia Aves., Cincinnati, O.

UNITED States Bronze Co. (The), 1831 Columbus Road, Cleveland, O.

VINCENT Valve Co., Sandusky, O.

WALTHAM Brass & Aluminum Co., Waltham, Mass.

WESTERN Brass Mfg. Works, 1125 W. 21st St., Chicago, Ill.

WILLIAMS Valve Co., D. T., 521-23 Hunt St., Cincinnati, O.

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

WOODRUFF & Sons Co., Walter W., Mount Carmel, Conn.

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ALUMINUM and BRONZE CASTINGS *solely* in the making of their cars.

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ACME Foundry Co., Sweeney St., Cleveland, O.

ATLAS Foundry Co., 801 So. Washington St., Peoria, Ill.
(See page 125.)

AMERICAN Foundry & Mfg. Co., 11th and Herbert Sts., St. Louis, Mo.

BARCUS & Co., Geo., Wabash, Ind.

BARLOW Foundry Co. (The), 28 Orange St., Newark, N. J.

BELLE CITY Mfg. Co., Racine Junction, Wis.

BRIDGEPORT Malleable Iron Co., Bridgeport, Conn.

BUFFALO Foundry Co., Buffalo, N. Y.

CAPITOL Foundry Co., Hartford, Conn.

CASCADE Foundry Co., 19th and Plum Sts., Erie, Pa.

CHICAGO Hardware Foundry Co., North Chicago, Ill.

CRAMP & Sons' Ship & Engine Building Co., Wm., Philadelphia, Pa.

DETROIT Stoker & Foundry Co., No. Grand Blvd. and Riopelle St., Detroit, Mich.

DOMESTIC Sewing Machine Co., Warren and High Sts., Newark, N. J.

EMMERT Mfg. Co., Waynesboro, Pa.

ENTERPRISE Foundry Co., Detroit, Mich.

ERIE Foundry Co., Erie, Pa.

FERRO Machine & Foundry Co. (The), 251 Wade Building, Cleveland, O.
(See page 215.)

FULTON Foundry & Machine Co., 25 Furman St., Brooklyn, N. Y.

GREY Iron Castings Co., Mt. Joy, Pa.

HAYES Foundry Co., Lynn, Mass.

HEINDEL Mfg. Co., Hanover, Pa.

HOLBROOK-Armstrong Iron Co., Racine, Wis.

HOPSON & Chapin Mfg. Co., New London, Conn.

HOULE Motor Works, A. J., Holyoke, Mass.

INDIANAPOLIS Foundry Co., Indianapolis, Ind.

INTER-State Foundry Co. (The), Sheridan St., Cleveland, O.

MANUFACTURERS' Foundry Co., Waterbury, Conn.

MASSEY Machine Co., Watertown, N. Y.

MEEKER Foundry Co., 95 Clay St., Newark, N. J.

MOORE Co., Franklin, Winsted, Conn.

NORTMANN-Duffke Foundry Co., 26th and Layton Aves., Milwaukee, Wis.

PALMER & De Mooy Foundry Co., Leonard and Winter Sts., Cleveland, O.

PARKHURST Mfg. Co., Peru, Ind.

PHILADELPHIA Stove & Iron Foundry Co., 1631 N. 5th St., Philadelphia, Pa.

RACINE Brass & Iron Co., Racine, Wis.

SESSIONS Foundry Co., Farmington Ave., Bristol, Conn.

SINTZ-Wallin Co. (The), 285 S. Front St., Grand Rapids, Mich.

SPENCER'S Sons, I. S., Guilford, Conn.

STANDARD Foundry & Mfg. Co., 2717 E. 75th St., Cleveland, O.

STOVER Mfg. Co., Freeport, Ill.

STOWELL Mfg. & Foundry Co., So. Milwaukee, Wis.

TARRANT Foundry Co., 36-66 Indiana St., Chicago, Ill.

THREE Rivers Furnace & Foundry Co., Three Rivers, Mich.

UTICA Foundry Co., Utica, N. Y.

UTICA Steam Engine & Boiler Works, Utica, N. Y.

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WESTERN Motor Co., Logansport, Ind.

WILCOX, Crittenden & Co., 83 Main St., Middletown, Conn.

CASTINGS (Malleable Iron)

ACME Steel & Malleable Iron Wks., 245 Military Road, Buffalo, N. Y.

ARCADE Malleable Iron Co., 63 Washington Sq., Worcester, Mass.

BARLOW Foundry Co. (The), 28 Orange St., Newark, N. J.

BEAVER Dam Malleable Iron Co., Beaver Dam, Wis.

BRIDGEPORT Malleable Iron Co., Bridgeport, Conn.

BUHL Malleable Iron Co., Detroit, Mich.

COLUMBUS Malleable Iron Co., Columbus, O.

DAYTON Malleable Iron Co., Dayton, O.

DUPLEX Roller Bushing Co., Belfast, Me.

FLAGG & Co., Stanley G., Philadelphia, Pa.

FRAZER & Jones Co., Syracuse, N. Y.

GLOBE Malleable Iron Co., Greenway Ave., Syracuse, N. Y.

ILLINOIS Malleable Iron Co., 535 Diversly Blvd., Chicago, Ill.

JANNEY, Steinmetz & Co., 4th and Market Sts., Philadelphia, Pa.
(See page 245.)

JOHNSON & Co., Isaac G., Spuyten Duyvil, N. Y. City.

MALLEABLE Iron Fittings Co., Branford, Conn.

MEEKER Foundry Co., 95 Clay St., Newark, N. J.

MESTA Machine Co., W. Homestead, Pa.

MINNESOTA Malleable Iron Co., St. Paul, Minn.

MOLINE Malleable Iron Co., St. Charles, Ill.

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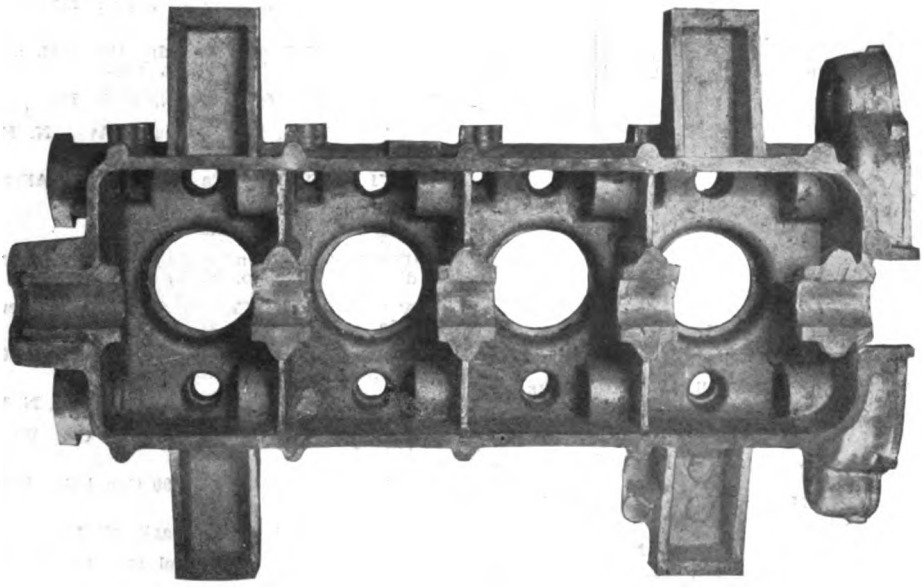

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NORWAY Iron & Steel Co., York, Pa.

OSHKOSH Malleable Iron Co., Oshkosh, Wis.

PORT HURON Engine & Thresher Co., Port Huron, Mich.

RACINE Malleable & Wrought Iron Co., Racine, Wis.

RHODE ISLAND Malleable Iron Works, Hills Grove, R. I.

SOUTH Side Steel & Malleable Casting Co., Windlake and 14th Aves., Milwaukee, Wis.

STOWELL Mfg. & Foundry Co., So. Milwaukee, Wis.

SYRACUSE Malleable Iron Works, Syracuse, N. Y.

WILMINGTON Malleable Iron Co., Wilmington, Del.

CASTINGS (Steel)

ACME Steel & Malleable Iron Wks., 245 Military Road, Buffalo, N. Y.

ADRIAN Steel Casting Co., Adrian, Mich.

AMERICAN Steel Castings Co., Chester, Pa.

ARCADE Malleable Iron Co., 63 Washington Sq., Worcester, Mass.

ATHA Steel Co., Newark, N. J.

BETHLEHEM Steel Co., So. Bethlehem, Pa.

BUFFALO Crucible Casting Co., 25 Washington St., Buffalo, N. Y.

CARPENTER Steel Co. (The), Reading, Pa.

CHESTER Steel Castings Co., Chester, Pa.

CHICAGO Steel Foundry Co., 19th and Rockwell Sts., Chicago, Ill.

CHROME Steel Works, Brooklyn, N. Y.

CRUCIBLE Steel Casting Co., Lansdowne, Pa.

CRUCIBLE Steel Castings Co., Milwaukee, Wis.

DUTCHER Co. (The), 640-80 Kinnikinnic Ave., Milwaukee, Wis.

FLAGG & Co., Stanley G., Philadelphia, Pa.

FRAZER & Jones Co., Syracuse, N. Y.

IMPERIAL Steel Co. (The), 218 Front St., Fremont, O.

JOHNSON & Co., Isaac G., Spuyten Duyvil, N. Y. City.

JOHNSTON, Geo. P., Sparrows Point, Md.

LOGAN Mfg. Co., Phoenixville, Pa.

MACKINTOSH, Hemphill & Co., Pittsburg, Pa.

MALLEABLE Iron Fittings Co., Branford, Conn.

MASSACHUSETTS Steel Casting Co., West Everett, Mass.

MESTA Machine Co., Pittsburg, Pa.

MICHIGAN Crucible Steel Castings Co., 248 Guion St., Detroit, Mich.

MILWAUKEE Steel Foundry Co., South Water and Virginia Sts., Milwaukee, Wis.

NEW England Steel Castings Co., Hyde Park, Mass.

NEWARK Iron & Steel Co., Newark, O.

NEW JERSEY Steel Co., Rahway, N. J.

NEW Process Steel Co. (The), Marshall, Mich.

NORTMANN-Duffke Foundry Co., 26th and Layton Aves., Milwaukee, Wis.

NORWAY Iron & Steel Co., York, Pa.

OTIS Steel Co., 3131 Lakeside Ave., N. E., Cleveland, O.

PROVIDENCE Steel Castings Co., 164 Allens Ave., Providence, R. I.

REED Mfg. Co., Kalamazoo, Mich.

RIPPEL Steel Foundry Co., E. G., 31-39 Indiana St., Buffalo, N. Y.

RIVERSIDE Steel Casting Co., 451-573 Riverside Ave., Newark, N. J.

SMITH Steel Castings Co., Geo. H., 500 Clinton St., Milwaukee, Wis.

TAYLOR Iron & Steel Co., High Bridge, N. Y.

TOBIN-Gerlinger Steel Castings Co., West Allis, Wis.

TOOL Steel Castings Co., 90 Canal St., Boston, Mass.

UNIFORM Steel Co., Newark, N. J.

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WHITELEY Steel Co., 108½ Jefferson St., Muncie, Ind.

WILMINGTON Malleable Iron Co., Wilmington, Del.

WORCESTER Steel Foundry Co., Millbury, Mass.

CELLULOID SHEETS

ARLINGTON Co. (The), 473-475 Broadway, N. Y. City.

LANDERS Bros., Co., Toledo, O., and Boston, Mass.
(See page 149.)

CEMENT (Tire)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill.
(See page 49.)

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers).
(See page 191.)

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 87.)

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Our Aluminum Alloy

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Our Manganese Bronze

the Parsons alloy has proven superior to all others.

Modern equipment enables us to turn out castings that cannot be equaled by old methods.

Our methods make a difference in price as well.

THE DAY FOUNDRY CO.

Illinois and Mary Sts.
BUFFALO, N. Y.

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BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 69.)

BROOKLYN Rubber Co., 397 Summer Ave., Brooklyn, N. Y.

BUFFALO Rubber Mfg. Co., Sussex Ave. and Erie R. R., Buffalo, N. Y.

BUFFALO Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.

CONTINENTAL Rubber Works, Erie, Pa.

DIAMOND Rubber Co., Akron, O.
(See page 183.)

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and (Jobbers).
(See page 71.)

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 77.)

HARTFORD Rubber Works Co., Hartford, Conn.
(See page 185.)

HOSMER Co., G. A., 376 Ellicott St., Buffalo, N. Y.

LYON Rubber Co., Akron, O.

M. & M. Manufacturing Co. (The), Akron, O.

MAGNET Cement & Dressing Co., 878 No. 48th St., Philadelphia, Pa.

MARTIN Evans Co., 1186 Bedford Ave., Brooklyn, N. Y.

MORGAN & Wright, Detroit, Mich.
(See page 205.)

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 101.)

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers).
(See page 239.)

NATIONAL Cement & Rubber Mfg. Co., 3053 Monroe St., Toledo, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers).
(See page 99.)

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers).
(See page 205.)

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers).
(See page 95.)

REA Bros. & Co., 202 Nicollet Ave., Minneapolis, Minn.

REPUBLIC Rubber Co. (The), Youngstown, O.

TINGLEY & Co., Chas. O., Rahway, N. J.

TRENTON Rubber Mfg. Co., Trenton, N. J.
(See page 181.)

YOUNG, Orlando W., 180 Frelinghuysen Ave., Newark, N. J.
(See page 141.)

CHAIN TOOLS

ADAPT Machinery Co. (The), 1624-30 Wabash Ave., Chicago, Ill.

BROWN Mfg. & Garage Co., Butler, Ind.

NEVER-Miss Spark Plug Co., Lansing, Mich.
(See page 115.)

CHAINS

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass.
(see page 151.)

CULLMAN Wheel Co., 1030 Dunning St., Chicago, Ill.
(See page 45.)

DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapolis, Ind.
(See page opposite.)

DUCKWORTH Chain & Mfg. Co., Springfield, Mass.

LEFEVRE Arms Co., Syracuse, N. Y.

LINK Belt Co., Chicago, Ill.

LINK Belt Engineering Co., Nicetown, Pa.

MILLER, Chas. E., 97 Reade St., N. Y. City. (Importer.)

MORSE Chain Co., Ithaca, N. Y.

PEUGEOT Freres, 296 Broadway, N. Y. City.
(See page 7.)

WHITNEY Mfg. Co. (The), Hartford, Conn.

CHANNELS

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

GARFORD Co. (The), Elyria, O.

HYDRAULIC Pressed Steel Co., Cleveland, O.
(See cover.)

STANDARD Welding Co. (The), Cleveland, O.

WESTON-Mott Co., Flint, Mich.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

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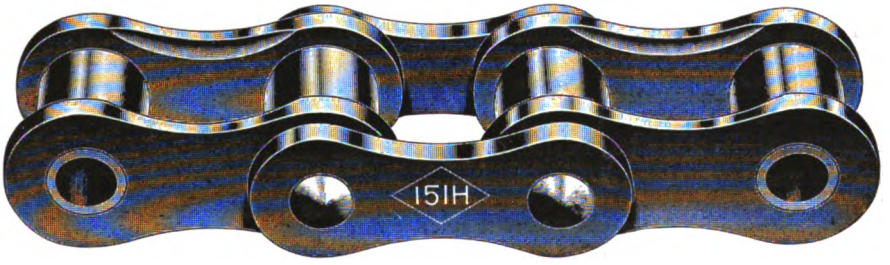
DIAMOND

CYCLE AND AUTOMOBILE

CHAINS

May be had in more sizes than any other make, and we are best prepared to furnish just the chain you need.



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BENJAMIN Electric Mfg. Co., 42 W. Jackson Blvd., Chicago, Ill.

BRONSON & Davis, 463 Fairmount Ave., Blue Island, Ill.

BULLOCK Electric Mfg. Co., Cincinnati, O.

ELECTRIC-Vehicle & Garage Co., 621 Grand Ave., Milwaukee, Wis.

ENGINEERING Specialty Co., Inc., 143 Liberty St., N. Y. City.

GENERAL Electric Co., Schenectady, N. Y.

GENERAL Power Co. (The), 100 William St., N. Y. City.

HOLTZER-Cabot Electric Co. (The), Brookline, Mass.

NEW England Motor Co., Liberty Sq., Lowell, Mass.

PERFECTION Magneto Co., Anderson, Ind.

RICHARDSON Engineering Co., 6 Ford St., Hartford, Conn.
(See page 219.)

ROTH Bros. & Co., 27-29 S. Clinton St., Chicago, Ill.

ROYAL Battery Co., 108-10 Duane St., N. Y. City.
(See page 7.)

STERLING Electric Motor Co., Dayton, O.

WAGNER Electrical Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 119.)

WITHERBEE Igniter Co., 541 W. 43d St., N. Y. City.
(See page 37.)

CHASSIS (Gasoline)

BENDIX Co. (The), 4212 State St., Chicago, Ill.
(See page 127.)

BORBEIN Auto Co., 2107 N. 9th St., St. Louis, Mo.
(See page 177.)

GARFORD Company (The), Elyria, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo.
(See page 99.)

SMITH Co., A. O., Milwaukee, Wis.

CLEVICES

(See Screw Machine Products)

CLOCKS (Auto)

AMERICAN Electrical Novelty Co., 308 Hudson St., N. Y. City.

BELFIELD & Co., H., 435 N. Broad St., Philadelphia, Pa.

CHICAGO Electric Mfg. Co., 60 W. Van Buren St., Chicago, Ill.

CHELSEA Clock Co., 16 State St., Boston, Mass. (Auto and Motor Boat).
(See page opposite.)

JONES Speedometer Co., New Rochelle, N. Y.

LEVY & Co., Manasseh, 182 Broadway, N. Y. City.

NEWMAN Clock Co., Masonic Temple, Chicago, Ill.

WILSON Auto. Clock Co., 935 Arch St., Philadelphia, Pa.

CLOTHING

(See Wearing Apparel)

CLUTCH LEATHERS

(See Leather, Friction)

CLUTCHES

BROWNELL-Trebert Co., 634-66 Lexington Ave., Rochester, N. Y.

CONTINENTAL Motor Mfg. Co. (The), Muskegon, Mich.
(See page 123.)

CROSS Engine Co., M. O., 800-06 Bellevue Ave., Detroit, Mich.

DOUBLE-Friction Coil Clutch Co., 45 Canal St., Chicago, Ill.

FORT Wayne Gear Co., Fort Wayne, Ind.

GARFORD Co. (The), Elyria, O.

GENERAL Mfg. Co., Elkhart, Ind.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

HAYDEN Mfg. Co., The N. L., 172-82 Locust St., Columbus, O.

JOHNSON Machine Co., The Carlyle, 356 Asylum St., Hartford, Conn.

KIRKHAM Motor Mfg. Co. (The), Bath, N. Y.

KONIGSLOW Mfg. Co., Otto, Cleveland, O.
(See page 49.)

LONG Arm System Co., Lakeside Ave. and 38th St., N. E., Cleveland, O.

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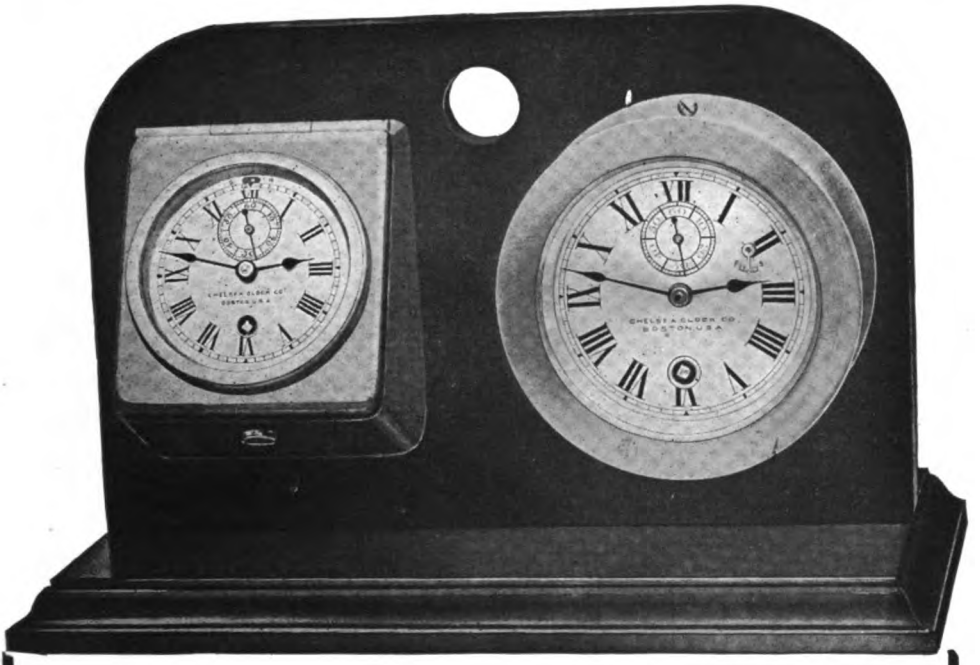

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THE "CHELSEA" AUTO CLOCK

(TRADE MARK)

BEST IN THE WORLD

¶ Clocks built with a view to stand the jars and jolts and rough riding of Automobiles. Reputation the highest. Used by parties demanding the BEST

PRICE LIST

In "Special" Cases (Design of Case Patented Dec. 19, 1905)		In "Round" Cases	
2¾ inch "Special" Auto Clock,	$36	2¾ inch Auto Clock,	$26
3½ inch "Special" Auto Clock,	$45	3½ inch Auto Clock,	$28
3½ inch "Special" Motor Clock,	$41	3½ inch Motor Clock,	$24

Wood Stands, if wanted by Dealers, viz.: for showing two clocks, $2.00; for showing one clock, $1.50

Sizes stated are the approximate diameters of the dials.

Above illustration shows in reduced size the 2¾ inch "SPECIAL" Auto Clock and 3½ inch (Round Cased) MOTOR Clock. The sizes are the approximate diameters of the dials. All are in Duplex (Patent applied for) Polished Cast Brass Cases, the most thoroughly waterproof case on the market. The "SPECIALS" show dial on angle; its clock when removed from outer (locked) case is excellent for use on mantels, bureaus, etc.; very convenient when touring. Outer case secured to dashboard by hidden screws. The 3½ inch MOTOR Clock is a strong, reliable clock, but the AUTO Clocks have a somewhat finer train. You want the BEST? Ask for the "CHELSEA."

CHELSEA CLOCK CO., 16 State Street, Boston

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MORGAN & ALLEN CO., 717 Market Street, San Francisco, Sales Agents for the Pacific Coast

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MUNCIE Auto Parts Co., 700 Elliott St., Muncie, Ind.

NATIONAL Brake & Clutch Co., Devonshire Bldg., Boston, Mass. (Cork Insert).
(See page 47.)

NORTH Chicago Machine Co., North Chicago, Ill.

NORTHWAY Motor & Mfg. Co., Maybury and Grand Aves., Detroit, Mich.

POWELL & Young, 52 W. 43d St., N. Y. City.

SMITH Co., A. O., Milwaukee, Wis.

SPEED Changing Pulley Co., 750 E. Washington St., Indianapolis, Ind.
(See page 121.)

STANDARD Brake Co. (The), 101 W. 66th St., N. Y. City.

TREBERT Gas Engine Co., 163-65 Main St., W., Rochester, N. Y.

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

UNIVERSAL Clutch Co., 226 S. 11th St., Philadelphia, Pa.

VERSTRAETE Mfg. Co., Ed., 421 Clinton St., Milwaukee, Wis.

WARNER Clutch Co., 1461 Michigan Ave., Chicago, Ill.

WAUKESHA Motor Co., 119 North St., Waukesha, Wis.

CROWELL, Gilmer, 292-296 Graham St., Brooklyn, N. Y.

EUREKA Pneumatic Spray Co., 92 Lafayette St., N. Y. City.

FERODOWILL Mfg. Co., St. Paul, Minn.

FULMER, C. F., Plainfield, N. J.

INGERSOL-Rand Co., 11 Broadway, N. Y. City.

JACOBSON Machine Mfg. Co., Warren, Pa.

KALISCH Air Brake Co., 106 Locust St., St. Louis, Mo.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

MARTIN & Anson Co., 2226 Indiana Ave., Chicago, Ill.

MIETZ, A., 138 Mott St., N. Y. City.

NATIONAL Brake & Electric Co., Milwaukee, Wis.

NEW Era Gas Engine Co., 9 Dale Ave., Dayton, O.

PACIFIC Tucking & Mfg. Co., 471 18th St., Brooklyn, N. Y.

SPACKE Machine Co., The F. W., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind.
(See page opposite.)

VICTOR Electric Co., 55-61 Market St., Chicago, Ill.

WESTINGHOUSE Air Brake Co., Pittsburg, Pa.

COCKS

(See Fittings, Pipe, Brass)

COMMUTATORS

(See Controllers, Electric)

COMPRESSION METERS

(Cylinder)

AUTO Novelty Co., Milwaukee, Wis.
(See page 211.)

BROWN, Henry W., 517-21 E. Water St., Syracuse, N. Y.

STANDARD Auto Supply & Mfg. Co., 20 Broad St., N. Y. City.

COMPRESSORS (Air)

AMERICAN Steam Pump Co., Battle Creek, Mich.

BRUCE-Meriam-Abbott Co. (The), 1688 Columbus Road, N. W., Cleveland, O.

CHICAGO Pneumatic Tool Co., 1010 Fisher Bldg., Chicago, Ill.

COVERS (Auto)

ABERCROMBIE & Fitch Co., 57 Reade St., N. Y. City.

AMERICAN Karbel Co., Jonesboro, Ark.

ANDERSON & Co., F. W., 729 So. Broad St., Philadelphia, Pa.
(See page 189.)

BRIDGEPORT Vehicle Co., South Ave. and Main St., Bridgeport, Conn.

BURGIN Bros., Springfield, Mass.

CHANNON & Co., H., Market and Randolph Sts., Chicago, Ill.

DUANE & Co., W. J., 304 W. 54th St., N. Y. City.

EMPIRE Gear & Top Co., 207 N. 22d St., Philadelphia, Pa.

FICKLING & Co., Inc., 145 E. 57th St., N. Y. City.

GILBERT Mfg. Co., New Haven, Conn.
(See page 31.)

HOLCOMB Co. (The), 105 Goffe St., New Haven, Conn.

HUME Carriage Co., Amesbury, Mass.
(See page 147.)

LANDERS Bros. Co., Toledo, O., and Boston, Mass.
(See page 149.)

MANHATTAN Auto Top Co., 249 W. 64th St., N. Y. City.

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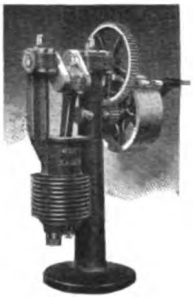
BELTED—MOTOR DRIVEN

Single and Three Cylinder Styles

Just the thing for public or private garage for inflating tires, cleaning cushions, etc.



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ACCIDENT CABINET

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Especially for Automobile Garages

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Insures your having in a neat case en tour, or fastened to the wall in a convenient place every article that up-to-date surgery would require to properly dress a wound.

It helps you, it helps the patient, it helps the physician.

The articles in the case would cost you much more at retail than we charge for the complete cabinet.

No chance of Loss of Life from Blood Poisoning if you have One of Our Cabinets.

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Kalamazoo, Michigan.

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MUTTY Co., L. J., 28 Summer St., Boston, Mass.
(See page 149.)

PARIS Auto Top Co., 236 W. 41st St., N. Y. City.

VEHICLE Apron & Hood Co., Columbus, O.

WILEY & Son Co., Wm. H., Hartford, Conn.

WOOD & Son, Frederick R., 219 W. 19th St., N. Y. City.

CONDENSERS

BLAKE Steam Pump & Condenser Co., Main St., Fitchburg, Mass.

LONG-Turney Mfg. Co., Rome, N. Y.

NATIONAL Equipment Co., Holland Bldg., St. Louis, Mo.

NATIONAL Oil Burner & Equipment Co., Holland Bldg., St. Louis, Mo.

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

WHITLOCK Coil Pipe Co. (The), Hartford, Conn.
(See page 145.)

CONNECTING RODS

AMERICAN & British Mfg. Co., Bridgeport, Conn.

ANDERSON Forge & Machine Co., Detroit, Mich.

BILLINGS & Spencer Co. (The), Russ and Lawrence Sts., Hartford, Conn.

ERIE Forge Co., Erie, Pa.

FUNK Engineering Co., 39-45 14th St., Hoboken, N. J.

GILL & Sons Forge & Machine Works, P. H., Brooklyn, N. Y.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

RICHMOND Forging Corporation, Richmond, Va.

SPACKE Machine Co., The F. W., Madison Ave., Merrill and Penn Sts., Indianapolis, Ind.
(See page 65.)

STANDARD Connecting Rod Co., Beaver Falls, Pa.
(See page opposite.)

TINDEL-Morris Co., Eddystone, Pa.

WYMAN & Gordon Co. (The), Worcester, Mass., and Cleveland, O.

CONNECTORS (Wire)

(See Wire Terminals)

CONTROLLERS (Electric)

ELECTRIC Vehicle Equipment Co., 20th St. and Montgomery Ave., Philadelphia, Pa.

ELWELL-Parker Electric Co., 1076 Hamilton St., Cleveland, O.

GENERAL Electric Co., Schenectady, N. Y.

KNOBLOCK - Heideman Mfg. Co., South Bend, Ind.

LAMB & Co., Kent and Lyon Sts., Grand Rapids, Mich.

LINCOLN Electric Co. (The), 1232 E. 3d St., N. E., Cleveland, O.

SCHUG Electric Mfg. Co., 326 Jefferson Ave., Detroit, Mich.
(See page 173.)

SPLITDORF, C. F., 261-65 Walton Ave., N. Y. City.
(See page 115.)

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 119.)

COOLERS (See Radiators)

CORK INSERTS (Brake and Clutch)

CONTINENTAL Motor Mfg. Co. (The), Muskegon, Mich.
(See page 123.)

NATIONAL Brake & Clutch Co., Devonshire Bldg., Boston, Mass.
(See page 47.)

NORTHWAY Motor & Mfg. Co. (The), Maybury and Grand Aves., Detroit, Mich.

STANDARD Brake Co. (The), 101 W. 66th St., N. Y. City.

COUPLINGS (Brass)

(See Also Fittings—Pipe)

FRIES & Co., 89-93 Main St., Buffalo, N. Y.

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 231.)

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

IMPERIAL Brass Mfg. Co., 247 So. Jefferson St., Chicago, Ill.

LUNKENHEIMER Co. (The), Cincinnati, O.

PEDERSEN Mfg. Co., 400-412 East 37th St., N. Y. City.
(See page 100.)

WILLIAMS Valve Co., D. T., 521-23 Hunt St., Cincinnati, O.

YOUSE, E. S., 46 N. 5th St., Reading, Pa.

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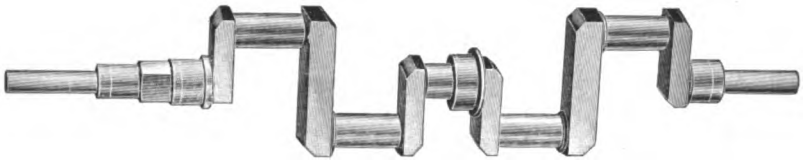

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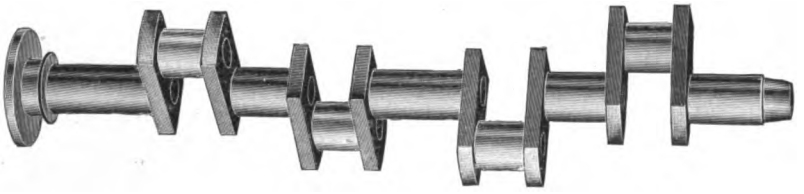
MADE FROM A SPECIAL GRADE OF

OPEN HEARTH STEEL STEAM HAMMERED FORGINGS

RE-HEATED AND OIL TEMPERED

Also NICKEL STEEL OR CHROME NICKEL STEEL

Any size up to four inches in diameter



All cylindrical parts finished true to sizes by grinding
No Stock Sizes

MADE TO ORDER ONLY FROM BLUE PRINTS OR DETAILED DRAWINGS FURNISHED

SEND COMPLETE SPECIFICATIONS FOR PRICES

Standard Connecting Rod Co.

BEAVER FALLS, PA.

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INGERSOLL-Rand Co., 11 Broadway, N. Y. City.

MORGAN, B., 88 John St., Newport, R. I.

NEW Jersey Car Spring & Rubber Co., Wayne and Brunswick Sts., Jersey City, N. J.

PITTSBURG Hose Connector Co., Pittsburg, Pa.

CRANK SHAFTS

AMERICAN & British Mfg. Co., Bridgeport, Conn.

ANDERSON Forge & Machine Co., Detroit, Mich.

ATLAS Mfg. Co. (The), 87 Wood St., Fostoria, O.

AUTO Crank Shaft Co., 793-97 Gratiot Ave., Detroit, Mich.

BATES Forge Co., 227 W. Merrill St., Indianapolis, Ind.

BILLINGS & Spencer Co. (The), Russ and Lawrence Sts., Hartford, Conn.

CAMBRIA Forge Co., Johnstown, Pa.

CARPENTER Steel Co. (The), Reading, Pa.

CHESTER Forging & Engineering Co. (The), Broad and Crosby Sts., Chester, Pa.

ERIE Forge Co., Erie, Pa.

FUNK Engineering Co., 39-45 14th St., Hoboken, N. J.

GILL & Sons Forge & Machine Works, P. H., Brooklyn, N. Y.

LELAND & Co., W. H., 1025 Southbridge St., Worcester, Mass.

NEW England Forge Co., 9 Plymouth St., Worcester, Mass.

NORTON Grinding Co., Worcester, Mass.

RICHMOND Forging Corp., Richmond, Va.

STANDARD Connecting Rod Co., Beaver Falls, Pa.
(See page 67.)

STANDARD Welding Co. (The), Cleveland, O.

TINDEL-MORRIS Co., Eddystone, Pa.

WILLIAMS & Co., J. H., 150 Hamilton Ave., Brooklyn, N. Y.

WYMAN & Gordon Co. (The), Worcester, Mass., and Cleveland, O.

CRUCIBLES

BRIDGEPORT Crucible Co., Bridgeport, Conn.

DIXON Crucible Co., Jos., Wayne and Monmouth Sts., Jersey City, N. J.

OBERMAYER Co., The S., 641 Evans St., Cincinnati, O.

WISCONSIN Graphite Co. (The), 847 Division St., Stevens Point, Wis.

CUPS (Ball)

CROSBY Co. (The), Buffalo, N. Y.
(See page 167.)

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page opposite.)

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 231.)

KEIM Mills, Inc., John R., Liberty St. and Kensington Ave., Buffalo, N. Y.

KONIGSLOW Mfg. Co., Otto, Cleveland, O.
(See page 49.)

NATIONAL Cycle Mfg. Co., Bay City, Mich.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

CUPS AND CONES

BOSTON Pressed Metal Co., 171-73 Union St., Worcester, Mass.

CORBIN Screw Corporation (The), New Britain, Conn.

CHICAGO Screw Co., 2 N. Canal St., Chicago, Ill.

DETROIT Screw Works, Detroit, Mich.
(See page 233.)

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page opposite.)

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 231.)

HOUGHTON & Buxton, Worcester, Mass.

KONIGSLOW Mfg. Co., Otto, Cleveland, O.
(See page 49.)

MATHEWS, H. A., Mfg. Co., Seymour, Conn.

NATIONAL Cycle Mgf. Co., Bay City, Mich.

PENINSULAR Milled Screw Co., 751 Bellevue Ave., Detroit, Mich.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WESTERN Automatic Machine Screw Co. Elyira, O.

CURTAINS

(See Aprons and Curtains, Storm)

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ALL LEADING MAKES
ASK FOR CATALOG

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4 cyl. List..... $8.00
6 cyl. List.....$10.00

B-R Commutator

Three fourths of the ignition trouble is due to timer defects. The "Timer all the Time" explains why this is true and tells how and why **THE B-R TIMER** stops engine misfiring, plug short circuits, sooty cylinders, etc. A request brings this circular which tells some things which perhaps you do not know, regarding engine troubles.

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BOWERS Metal Stamping Co., 718 E. 11th St., New York, N. Y.

CARR, F. S., 74 Pearl St., Boston, Mass. (See page 149.)

METAL Stamping Co., 243 West St., N. Y. City.

MURPHY Co., The G. W. J., Merrimac, Mass.

NEIDER Co., The F. A., Augusta, Ky. (See page 187.)

PARRY & Co., A. N., Amesbury, Mass.

ROEHM & Davison, Ltd., Woodbridge and Wayne Sts., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (See page 139.)

TAYLOR Co., H. D., 103-105 Oak St., Buffalo, N. Y.

UNITED States Fastener Co., 95 Milk St., Boston, Mass. (See page 169.)

WEISS & Son, Chas., 4725 Cottage Grove Ave., Chicago, Ill.

WING Co., Charles, Amesbury, Mass.

CUSHIONS

ANDERSON & Co., F. W., 729 So. Broad St., Philadelphia, Pa. (See page 189.)

AUTO Top Co., 209 E. Columbia St., Fort Wayne, Ind. (See page 235.)

EMPIRE Gear & Top Co., 207 N. 22d St., Philadelphia, Pa.

HILL Mfg. Co., 25-27 Fuller St., Buffalo, N. Y.

LARRIMORE Buggy Top Co., Baltimore, Md.

MECHANICAL Fabric Co., Providence, R. I.

MICHIGAN Top Co., 15-17 Duffield St., Detroit, Mich.

NEWTON & Son, W. H., 127 Elm St., Cortland, N. Y.

PELINKA, Frank, 409 Blue Island Ave., Chicago, Ill.

PNEUMATIC Mfg. Co., 3 South St., N. Y. City.

SCHUBERT Bros. Gear Co., 42-44 Cedar St., Oneida, N. Y.

SPRINGFIELD Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass. (See page 189.)

VENTILATED Cushion & Spring Co., Fisher Bldg., Chicago, Ill.

DASHES AND FENDERS

A-Z Co. (The), 527 West 56th St., N. Y. City.

AMERICAN Auto Brass Co. (The), 181 W. Maple St., Columbus, O.

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J. (See page 17.)

AMESBURY Metal Body Co., Clark and Elm Sts., Amesbury, Mass.

AUTO Body Co. (The), Franklin Ave., Lansing, Mich.

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (See page 223.)

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BRIDGEPORT Vehicle Co., South Ave. and Main St., Bridgeport, Conn.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (See page 145.)

COLE & Woop, 48 W. 67th St., N. Y. City.

DANN Bros. & Co. (The), 80-88 Franklin St., New Haven, Conn.

DETROIT Auto Specialty Co., 909-911 Greenwood Ave., Detroit, Mich. (See page 72.)

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

EVERITT, B. F., 65 E. Fort St., Detroit, Mich.

FEDDERS Mfg. Works, Buffalo, N. Y. (See page 175.)

GRAY & Sons, Peter, 88-90 Union St., Boston, Mass.

HALL, E. H. Co. (The), Inc., 12 Elm St., Rochester, N. Y.

HAYES Mfg. Co., 360-370 Maybury Ave., Detroit, Mich. (See page 72.)

INDIANAPOLIS Dash Co., Indianapolis, Ind.

KELLS Mfg. Co., W. J., 60-62 Van Winkle Ave., Jersey City, N. J.

KEYSTONE Wagon Works, Reading, Pa.

KINSEY Mfg. Co., 1126 E. 3d St., Dayton, O.

LOCKE & Co., 218-220 West 84th St., New York.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

McKINNON Dash Co., Buffalo, N. Y.

MOORE & Munger Co., 602 W. 52d St., N. Y. City.

MULLINS Co., The W. H., 124 Franklin St., Salem, O.

NEW York Dash & Fender Co., 516-520 W. 36th St., N. Y. City.

OFF & Co., Christian, Indianapolis, Ind.

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

PETERS & Herron Dash Co. (The), Columbus, O.

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Smith Co., A. O., Milwaukee, Wis.

SPRINGFIELD Metal Body Co., 387 Birnie Ave., Brightwood, Mass.
(See page 235.)

UNITED States Aluminum Co., Pittsburg, Pa.

WRIGHT Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill.

DEALERS AND JOBBERS

(Accessories and Supplies)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill.
(See page 103.)

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich.
(See page 191.)

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill.
(See page 87.)

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill.
(See page 69.)

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill.
(See page 71.)

FRANCO-Americanu Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill.
(See page 77.)

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill.
(See page 101.)

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City.
(See page 239.)

NEUSTADT Auto & Supply Co., St. Louis, Mo.
(See page 99.)

NEW York Sporting Goods Co., 17 Warren St., New York.
(See page 205.)

POPE Mfg. Co., Hartford, Conn.
(See page 95.)

DRIP PANS

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O.
(See page 223.)

BURROWS Co., E. T., Portland, Me.

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

HAYES Mfg Co., 360-70 Maybury Ave., Detroit, Mich.
(See page opposite.)

MULLINS Co., The W. H., 124 Franklin St., Salem, O.

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

WRIGHT Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

DROP FORGINGS

AMERICAN & British Mfg. Co., Bridgeport, Conn.

ANDERSON Forge & Machine Co., Detroit, Mich.

ATLAS Drop Forge Co., Lansing, Mich.

ATWATER Mfg. Co. (The), Southington, Conn.

BAKER, Jas. H., Mfg. Co., 503 Park Bldg., Pittsburg, Pa.

BARNETT Drop Forging Co., East Hampton, Mass.

BATES Forge Co., 227 W. Merrill St., Indianapolis, Ind.

BELDEN Machine Co., New Haven, Conn.

BETHLEHEM Steel Co., So. Bethlehem, Pa.

BILLINGS & Spencer Co. (The), Russ and Lawrence Sts., Hartford, Conn.

BLAKESLEE Forging Co., Plantville, Conn.

BOSTON Pressed Metal Co., 171-73 Union St., Worcester, Mass.

CAMBRIA Forge Co., Johnstown, Pa.

CAPE Ann Tool Co., Pigeon Cove, Mass.

CARPENTER Steel Co. (The), Reading, Pa.

CHICAGO Drop Forge & Foundry Co., 115th Place and M. C. Ry., Kensington, Ill.

CLAPP, E. D., Mfg. Co. (The), Auburn, N. Y.

CLEVELAND Hardware Co., E. 45th St. and Lakeside Ave., Cleveland, O.

COLUMBUS Bolt Works, 162 W. Randolph St., Columbus, O.

CONSOLIDATED Mfg. Co., Toledo, O.
(See page opposite.)

CORLISS Engine Works, Providence, R. I.

CORTLAND Forging Co., Cortland, N. Y.
(See page 45.)

CRESCENT Forgings Co., Oakmont, Pa.

DETROIT Forging Co., Detroit, Mich.

DETROIT Steel Products Co., 141 St. Antoine St., Detroit, Mich.
(See front cover.)

EASTERN Forge Co., 70 Kilby St., Boston, Mass.

ECCLES, Richard, Auburn, N. Y.

FUNK Engineering Co., 39-45 14th St., Hoboken, N. J.

GAUTIER & Co., D. G., 20 Cliff St., N. Y. City.

GENERAL Drop Forge Co., 1738 Elmwood Ave., Buffalo, N. Y.

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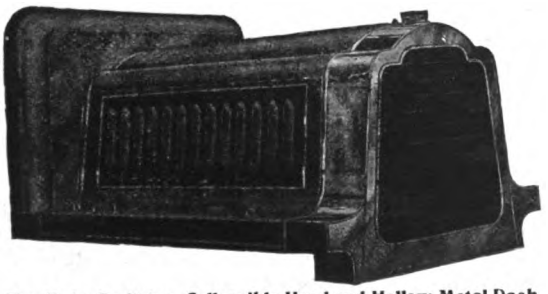

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KEYSTONE Drop Forge Works, Chester, Pa.

KILBORN & Bishop Co. (The), 81 Lloyd St., New Haven, Conn.

KINGSTON Truck & Bolt Co., Kingston, N. Y.

MACHINERY Forging Co., Hamilton & Marquette Sts., Cleveland, O.

MICHIGAN Bolt & Nut Works, foot of Meldrum Ave., Detroit, Mich.

MOORE Drop Forging Co., Springfield, Mass.

PAIGE-Storms Drop Forge Co., Chicopee Falls, Mass.

REVERE Drop Forge Co., Revere, Mass.

RICHMOND Forging Corporation, Richmond, Va.

RYMAN Co., K. L., 164 Market St., Newark, N. J.

SCRANTON Forging Co., Scranton, Pa.

SEWARD & Son Co., M., Grant St., New Haven, Conn.

SMITH Co., A. O., Milwaukee, Wis.

SMITH & Co., H. D., Plantsville, Conn.

STRIEBY & Foote Co., 301 Ogden St., Newark, N. J.

SUNDBERG Co., J. A., 271 W. Kenzie St., Chicago, Ill.

TRASNUE & Williams Co. (The), Alliance, Ohio.

UNION Drop Forge Co., 64-76 E. Ohio St., Chicago, Ill.

WESTERN Drop Forge Co., Marion, Ind.

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WHITMAN & Barnes Mfg. Co. (The), Chicago, Ill.

WILCOX Mfg. Co., D., Mechanicsburg, Pa.

WILLIAMS & Co., J. H., 150 Hamilton Ave., Brooklyn, N. Y.

WORCESTER Pressed Steel Co., Greendale, Mass. (Cold.)
(See page 143.)

WYMAN & Gordon Co. (The), Worcester, Mass., and Cleveland, O.

DUST RINGS

BOOTH, N. E., 743-45 39th St., Brooklyn, N. Y.
(See page opposite.)

BOWEN Mfg. Co., 16 Canal St., Auburn, N. Y.
(See page 93.)

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

EJECTORS

LOCKE Regulator Co., 76 North St., Salem, Mass.

PENBERTHY Injector Co., Detroit, Mich.

RUE Mfg. Co., 215 Race St., Philadelphia, Pa.

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

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(See page opposite.)

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OTIS Elevator Co., Railway Exchange, Chicago, Ill.

PARKHURST Mfg. Co., Peru, Ind.

STORM Mfg. Co., foot of Centre St., Newark, N. J.

EMERGENCY CASES (Medical)

ABBEY & Co., P. L., Kalamazoo, Mich.
(See page 65.)

UNITED States Emergency Case Co., Utica, N. Y.

ENAMEL

ACME White Lead & Color Wks., Detroit, Mich.

ADAMS & Elting Co., 155 Washington Blvd., Chicago, Ill.

AMERICAN Enamel Co., Neville St., Providence, R. I.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill.
(See page 103.)

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FELTON, Sibley & Co., 136-140 North Fourth St., Philadelphia, Pa.

GLIDDEN Varnish Co., Rockefeller Bldg., Cleveland, O.

MASURY & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

NATIONAL Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, O.

PATTERSON-Sargent Paint Co., Prospect and Huron Sts., Cleveland, O.

ROSENBLUTH & Co., A. J., 106 Park St., New Haven, Conn.

RUBBER Paint Co., 154-156 W. Van Buren St., Chicago, Ill.

SHERWIN-Williams Co., 100 Canal St., Cleveland, O.

STANDARD Varnish Works, 29 B'way, N. Y. City.
(See page 201.)

VALENTINE & Co., 257 Broadway, N. Y. City.

WATTS-De Golyer Co. (The), 377-391 Illinois St., Chicago, Ill.

ENGINES (Steam)

ABELL, Rollin, 370 Atlantic Ave., Boston, Mass.

DIETER Steam Engine Co., 123 Liberty St., N. Y. City.

ESTY, Wm., 59 Mill St., Laconia, N. H.

HILBURN, Edwin, Spring Valley, Minn.

GAS Engine & Power Co. & Chas. L. Seabury Co., Morris Heights, N. Y. City.

LAKEPORT Mfg. Co., Lakeport, N. H.

MASON Regulator Co., 158 Summer St., Boston, Mass.

MILNE, Frank, Crescent St., Everett, Mass.

NADIG & Bro. Mfg. Co., C. H., 16-24 No. 4th St., Allentown, Pa.

OFELDT & Sons, F. W., Nyack-on-the-Hudson, N. Y.

RACINE Engine & Machinery Co., Racine, Wis.

RANDALL, G. N., 1094 French St., Meadville, Pa.

ROCHESTER Machine Tool Works, Ltd., Rochester, N. Y.

SANTA Ana Machine & Foundry Co., Santa Ana, Cal.

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

WILLIAMS Co., The John, 114-118 Liberty St., N. Y. City.

EYE SHIELDS

AMERICAN Thermo-Ware Co., 16 Warren St., N. Y. City (Importers).

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 103.)

AUTOLYTE Mfg. Co., 10-12 Thomas St., N. Y. City.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers).
(See page 191.)

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers.
(See page 87.)

BAY State Goggle Co., 115 Walnut St., Malden, Mass.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 69.)

CHICAGO Eye Shield Co., 143-45 S. Clinton St., Chicago, Ill.

EHRLICH & Sons, J., 1274 Broadway, N. Y. City.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. Dealers and Jobbers).
(See page 71.)

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page opposite.)

FRIEDLANDER & Bro., Joseph, 8 Maiden Lane, N. Y. City.

GLOBE Optical Co., Boston, Mass.

LLOYD & Co., A. J., 323 Washington St., Boston, Mass.

MEYROWITZ, E. B., 104 E. 23d St., N. Y. City.

MILLS Mfg. Co., 1368 Broadway, N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 101.)

MUNSELL & Co., Eugene, 218 Water St., N. Y. City.

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers).
(See page 239.)

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers).
(See page 99.)

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers).
(See page 205.)

NORTH Carolina Mica Co., 95 Blackstone St., Boston, Mass.

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HARRIS Safety Co., 39 E. 20th St., N. Y. City.

HAVERHILL Fire Appliance Co., Haverhill, Mass.

HAYWARD & Co., S. F., 20 Warren St., N. Y. City.

JOHNS-Manville Co., H. W., 100 William St., N. Y. City.

LANDAU, Henry W., 117 Green St., Newark, N. J.
(See page opposite.)

LIBERTY Association, 12 State St., Chicago, Ill.
(See page opposite.)

LITTLE Giant Mfg. Co., 88 Wall St., N. Y. City.

MARTEN-Diggs Fire Extinguisher Co., 141 Centre St., N. Y. City.

MONARCH Fire Appliance Co., 249 Pearl St., New York City.

NEVERMISS Fire Extinguisher Co., Middletown, N. Y.

PHOENIX Appliance Co., 34 W. 26th St., N. Y. City.

REX Fire Extinguisher Co., 74 Cortlandt St., N. Y. City.

ROCKFORD-Kalamazoo Fire Extinguisher Co., 424 Ashton Bldg., Rockford, Ill.

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CENTRAL Brass Works, Cincinnati, Ohio.

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CRANE Co., 519 S. Canal St., Chicago, Ill.

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(See page 69.)

HAMLIN & Emery Brass Co., 26 Island St., Boston, Mass.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

HAYDENVILLE Co., Haydenville, Mass.

HOFFMAN & Billings Manufacturing Co., 100 Second St., Milwaukee, Wis.

HUMPHREYS Mfg. Co., Mansfield, O.

IDEAL Manufacturing Co., Detroit, Mich.

ILLINOIS Malleable Iron Co., 535 Diversey Bldg., Chicago, Ill.

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JARECKI Manufacturing Co., Erie, Pa.

KINSEY & Mahler Co., Peoria, Ill.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio.
(See page 49.)

LUNKENHEIMER Co. (The), Cincinnati, O.

McDONALD & Morrison Manufacturing Co., A. Y., Dubuque, Iowa.

McNAB & Harlin Mfg. Co., 56 John St., N. Y. City.

McRAE & Roberts Co. (The), 227-235 Campbell Ave., Detroit, Mich.

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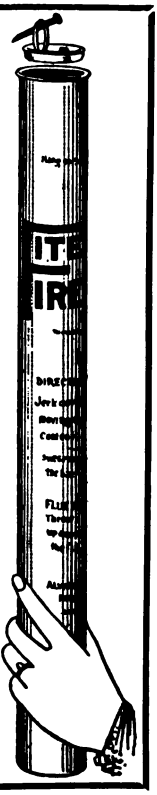

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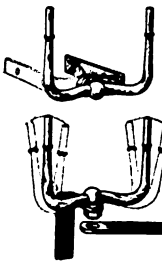

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PIONEER Brass Works, 424 S. Penna. St., Indianapolis, Ind.

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POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.

POWHATTAN Brass & Iron Works, Charlestown, W. Va.

PREST-O-Lite Co. (The), 1904 Broadway, N. Y. City.
(See page 179.)

QUEEN City Brass & Iron Works, Cincinnati, O.

REGESTER'S Sons Co., J., Holliday and Saratoga Sts., Baltimore, Md.

ROSE, Clarence H., 1905 Park Row Bldg., N. Y. City.

RUNDLE-Spence Mfg. Co., Milwaukee, Wis.

SPEAKMAN Supply & Pipe Co., Wilmington, Del.

SPENCE Mfg. Co., 279 Park St., Milwaukee, Wis.

STANDARD Metalwork Co., Thompsonville, Conn.

STANDARD Sanitary Mfg. Co., Pittsburg, Pa.

STEBBINS Mfg. Co., E., Springfield, Mass.

THOMAS Brass and Iron Co., Waukegan, Ill.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WALWORTH Manufacturing Co., Boston, Mass.

WESTERN Tube Co., Kewanee, Ill.

WILLIAMS Valve Co., D. T., 521-23 Hunt St., Cincinnati, O.

FOOT RESTS

APPLIANCE Mfg. Co. (The), 72-86 W. Jackson Boulevard, Chicago, Ill.
(See page 49.)

AUTO Rail & Equipment Co. (The), 113 Michigan Trust Bldg., Grand Rapids, Mich.

BURROWS Co., E. T., Portland, Me.

EMPIRE Gear & Top Co., 207 N. 22d St., Philadelphia, Pa.

FICKLING & Co., Inc., 145 E. 57th St., N. Y. City.

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

HUME Carriage Co., Amesbury, Mass.
(See page 147.)

NEW York Coach & Auto Lamp Co., 794-98 10th Ave., N. Y. City.

POLSON, W. F., 22 W. Utica St., Buffalo, N. Y.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich.
(See page 139.)

TEEL Mfg. Co., 132 Main St., Medford, Mass.

WARNER Pole & Top Co., 1648 Central Ave., Cincinnati, O.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

FOOT WARMERS
(See Heaters)

FORGE EQUIPMENT

AMERICAN Blower Co., Detroit, Mich.

AMERICAN Gas Furnace Co., 24 John St., N. Y. City.

BILLINGS & Spencer Co. (The), Russ and Lawrence Sts., Hartford, Conn.

BOYNTON & Plummer, Worcester, Mass.

BUFFALO Forge Co., Buffalo, N. Y.

INGERSOLL-Rand Co., 11 Broadway, N. Y. City.

MINER & Peck Mfg. Co., 419 Chapel St., New Haven, Conn.

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AMERICAN & British Mfg. Co., Bridgeport, Conn.

BETHLEHEM Steel Co., So. Bethlehem, Pa.

HYDRAULIC Pressed Steel Co., Cleveland, O.
(See cover.)

KINSEY Mfg. Co., 1126 E. 3d St., Dayton, O.

PARISH Mfg. Co., 7th and Chestnut Sts., Reading, Pa.

PARISH & Bingham Co., Cleveland, O.
(See page opposite.)

SMITH Co., A. O., Milwaukee, Wis.

FRICTION CLUTCHES
(See Gears)

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DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

GRAY & Sons, Peter, 88-90 Union St., Boston, Mass.

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WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill.

GALVANIZING

BRIDGEPORT Electro Plating Co., Bridgeport, Conn.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J.
(See page 145.)

GALVANIZING Co. (The), 525 N. Front St., Philadelphia, Pa.

UNITED States Electro-Galvanizing Co., 1-9 Park Ave., Brooklyn, N. Y.

GASKETS

GASKET Supply Co., 1516 Sansom St., Philadelphia, Pa.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

GOODWIN & Kintz Co., Winsted, Conn.

GUILLOTT Metal Gasket Co., 97 S. Clinton St., Chicago, Ill.

HERZ & Co., 203-205 Lafayette St., N. Y. City (Importers).

JOHNS-Manville Co., H. W., 100 William St., New York.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio.
(See page 49.)

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 11.)

MORSE, R. F., 74 Weybosset St., Providence, R. I.

NEW Jersey Asbestos Co., Camden, N. J.

NEW Jersey Car Spring & Rubber Co., and Brunswick Sts., Jersey City, N. J.

NEW York Asbestos Co., 80 John St., N. Y. City.

SMOOTH-ON Mfg. Co., 572-74 Communipaw Ave., Jersey City, N. J.

UNITED States Indestructible Gasket Co., 16 So. William St., N. Y. City.

UNITED States Mineral Wool Co., 143 Liberty St., N. Y. City.

GATES (Driveway)

MANLOVE Gate Co., 272 Huron St., Chicago, Ill.

GAUGES (Gasoline Tank)

AMERICAN Steel Barrel Co., 204-206 Varet St., Brooklyn, N. Y.

BLOOD Bros. Machine Co., Kalamazoo, Mich.

BOSTON Auto Gage Co., 613 Old South Bldg., Boston, Mass.
(See page 243.)

CONNECTICUT Telephone & Electric Co., Inc., Meriden, Conn.

EMERGENCY Wheel & Novelty Co., Port Huron, Mich.

FREER Gauge Co., Everett Bldg., Akron, O.

KINSEY Mfg. Co., 1126 E. 3d St., Dayton, O.

OHIO Brass Co., Mansfield, O.

RUTENBER Co., Chicago, Ill.

SIMMONS Co., John., 104-110 Centre St., N. Y. City.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page opposite.)

WEBSTER Mfg. Co., 72 Brush St., Detroit, Mich.

GAUGES (Pressure)

AMERICAN Steam Gauge & Valve Mfg. Co., Jamaica Plains, Boston, Mass.

ASHCROFT Mfg. Co., 87 Liberty St., N. Y. City.

ASHTON Valve Co. (The), 271 Franklin St., Boston, Mass.

AUTO Novelty Co., Milwaukee, Wis.
(See page 211.)

BELFIELD & Co., H., 435 N. Broad St., Philadelphia, Pa.

BOSTON Steam Specialty Co., 168-170 Congress St., Boston, Mass.

CROSBY Steam Gage & Valve Co., 97 Oliver St., Boston, Mass.

PITTSBURG Gauge & Supply Co., 309 Water St., Pittsburg, Pa.

SCHAEFER & Budenburg Mfg. Co., Foxboro, Mass.

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

WRAY PUMP & Register Co., 191-93 Mill St., Rochester, N. Y.

GAUGES (Water Line)

AMERICAN Steam Gauge & Valve Mfg. Co., Jamaica Plain, Boston, Mass.

ASHTON Valve Co. (The), 271 Franklin St., Boston, Mass.

KNOWLSON & M'Conihe, 65 River St., Troy, N. Y.

McRAE & Roberts Co. (The), 227-235 Campbell Ave., Detroit, Mich.

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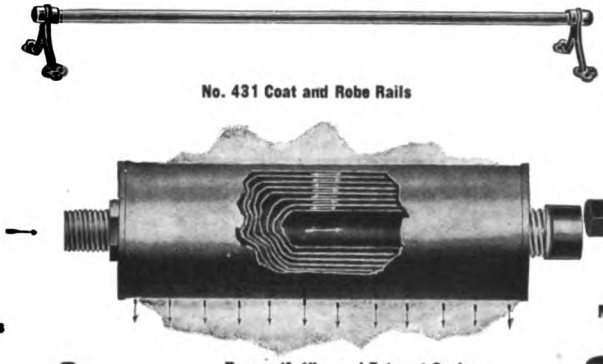

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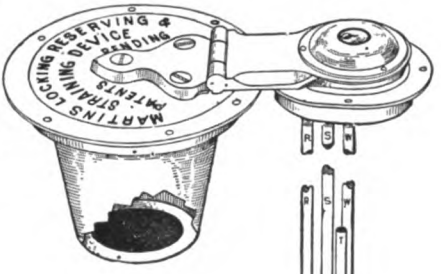
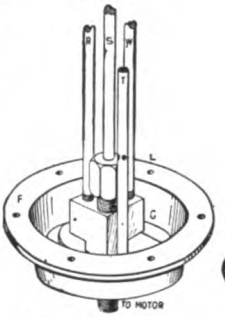
Martin Reserve and Lock Valve

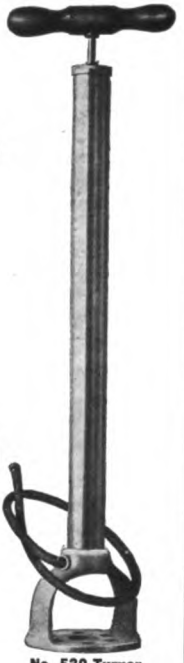
Martin Multiple Feed Lubricator

Martin Gasoline Strainer





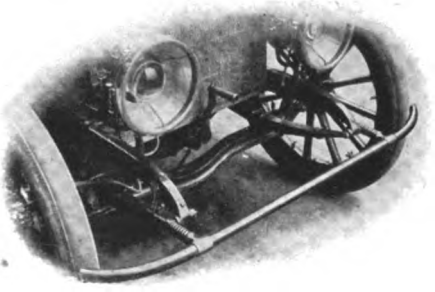
Martin Locking, Reserving, Supplying and Straining Device



No. 530 Turner Foot Pump

Turner Auto Carburettor--4 Sizes

Turner Polished Bronze Foot Treadles (Single and Double)



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STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

GEAR BLANKS

DETROIT Screw Works, Detroit, Mich. (See page 233.)

FUNK Engineering Co., 39-45 14th St., Hoboken, N. J.

GAUTIER & Co., D. G., 20 Cliff St., N. Y. City.

GILL & Sons Forge & Machine Works, P. H., 1 Lorraine St., Brooklyn, N. Y.

GRANGER'S Drop Forge Works, 25-29 S. Canal St., Chicago, Ill.

HARTFORD Machine Screw Co., Hartford, Conn. (See page 231.)

MICHIGAN Automobile Co., Ltd., Kalamazoo, Mich. (See page 123.)

NEW England Forge Co., 9 Plymouth St., Worcester, Mass.

WESTERN Drop Forge Co., Marion, Ind.

GEAR CASES (Auto)

ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (See page 55.)

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O. (See page 223.)

BRIDGEPORT Deoxidized Bronze & Metal Co., Bridgeport, Conn.

CROSBY Co. (The), Buffalo, N. Y. (See page 167.)

GARFORD Co. (The), Elyria, O.

LIGHT Mfg. & Foundry Co., Union and Queen Sts., Pottstown, Pa. (See page opposite.)

NIAGARA Falls Brass Works, Inc., Niagara and Virginia Sts., Buffalo, N. Y. (See page 57.)

PIONEER Brass Works, 424 S. Penna. St., Indianapolis, Ind.

SYRACUSE Aluminum & Bronze Co., 530 Leavenworth Ave., Syracuse, N. Y. (See pages 27 and 53.)

UNITED States Bronze Co. (The), 1831 Columbus Road, Cleveland, O.

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

WORCESTER Pressed Steel Co., Greendale, Mass. (See page 143.)

GEARS (Differential)

BOSTON Gear Wks., Norfolk Downs, Mass.

BROWN-Lipe Gear Co., Syracuse, N. Y. (See page 169.)

BULTMAN Co., The F. H., 2108 Superior Ave. Viaduct, Cleveland, O.

CULLMAN Wheel Co., 1030 Dunning St., Chicago, Ill. (See page 45.)

GARFORD Co. (The), Elyria, O.

MUNCIE Auto Parts Co., 700 Elliott St., Muncie, Ind.

MUNCIE Gear Works, 801 E. Charles St., Muncie, Ind.

NUTTALL Co., R. D., Fayette St. and Garrison Way, Pittsburg, Pa.

WABASH Gear Works, Terre Haute, Ind.

WARNER Gear Co., Muncie, Ind.

GEARS (Transmission)

ALEXANDER, James, 68 W. Monroe St., Chicago, Ill.

AMERICAN Die & Tool Co., Reading, Pa.

BELDEN Auto Transmission Co., 1005 Bessemer Bldg., Pittsburg, Pa.

BENDIX CO. (The), 4212 State St., Chicago, Ill. (See page 127.)

BEVERLY Mfg. Co., Beverly, Mass.

BOSTON Gear Works, Norfolk Downs, Mass.

BROWNELL-Trebert Co., 634-66 Lexington Ave., Rochester, N. Y.

BROWN-Lipe Gear Co., Syracuse, N. Y. (See page 169.)

BULTMAN Co., The F. H., 2168 Superior Ave., Viaduct, Cleveland, O.

CLARK Motor Co., E. C., Jackson, Mich.

CONTINENTAL Motor Mfg. Co. (The), Muskegon, Mich. (See page 123.)

COTTA, Chas., Rockford, Ill.

CROSS Engine Co., M. O., 800-06 Bellevue Ave., Detroit, Mich.

CURRIER, Gardner & Bullis, Coudersport, Pa.

FOOTE Bros. Gear & Machine Co., 24 S. Clinton St., Chicago, Ill.

FORT Wayne Gear Co., Fort Wayne, Ind.

GARFORD Co. (The), Elyria, O.

GEARLESS Transmission Co., German Insurance Bldg., Rochester, N. Y.

GENERAL Manufacturing Co., Elkhart, Ind.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (See page 5.)

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KIRKHAM Motor Mfg. Co. (The), Bath, N. Y.

KONIGSLOW Mfg. Co., Otto, Cleveland, O.
(See page 49.)

LAUTH & Co., J., 528 Elston Ave., Chicago, Ill.

LEE Mfg. Co. (The), Port Huron, Mich.

LONG Arm System Co., Cleveland, O.

MANNING Transmission Co., E. H., Franklin and 2d Sts., Elkhart, Ind.

MEISEL Press & Mfg. Co., 944-48 Dorchester Ave., Boston, Mass.

MILWAUKEE Auto Engine & Supply Co., 706-08 Winnebago St., Milwaukee, Wis.

MILWAUKEE Motor Co., 615 Clybourn Ave., Milwaukee, Wis.

MUNCIE Auto Parts Co., 700 Elliott St., Muncie, Ind.

NEW York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.

NORTHWAY Motor & Mfg. Co., Maybury and Grand Aves., Detroit, Mich.

NUTTALL Co., R. D., Fayette St. and Garrison Way, Pittsburg, Pa.

PHILLIPS Motor Works, W. L., 405 Tacoma Bldg., Chicago, Ill.

PURITAN Machine Co., 12-16 Gratiot Ave., Detroit, Mich.

REDINGTON Co., F. B., 107-09 S. Sangamon St., Chicago, Ill.

RICHMOND Forging Corporation, Richmond, Va.

ROSS Tool & Gear Co., 849 Main St., Lafayette, Ind.

SHATTUCK Co., W. P., 2125 Girard Ave., So. Minneapolis, Minn.

SINTZ, Guy L., Fulton and Front Sts., Grand Rapids, Mich.

SMITH Co., A. O., Milwaukee, Wis.

SPACKE Machine Co., The F. W., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.
(See page 65.)

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

SYRACUSE Gear Co., Syracuse, N. Y.

THROOP Perforating Co., 80 Terrace, Buffalo, N. Y.

TREBERT Gas Engine Co., 163-165 Main St. W., Rochester, N. Y.

VIRTUE & Pound Mfg. Co., Owatonna, Minn.

WARNER Gear Co., Muncie, Ind.

WAUKESHA Motor Co., 119 North St., Waukesha, Wis.

WESTERFIELD Motor Co. (The), 1531 Main St., Anderson, Ind.

GEARS, REVERSE (Marine)

ALEXANDER, James, 68 W. Monroe St., Chicago, Ill.

BEVERLY Mfg. Co., Beverly, Mass.

BRODIE, Wm. H., 45 Vesey St., N. Y. City.

BROWNELL-Trebert Co., 634-66 Lexington Ave., Rochester, N. Y.

CONTINENTAL Motor Mfg. Co. (The), Muskegon, Mich.
(See page 123.)

CROSS Engine Co., M. O., 800-06 Bellevue Ave., Detroit, Mich.

GIES Gear Co., 345-347 Bellevue Ave., Detroit, Mich.

HOLLODAY Mfg. & Engineering Co., 160 Bunker St., Chicago, Ill.

JOHNSON Machine Co., The Carlyle, 356 Asylum St., Hartford, Conn.

McFARLAND Foundry & Machine Co., Inc., Trenton, N. J.

NEW York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.

SNOW & Petrelli Mfg. Co. (The), 441 Chapel St., New Haven, Conn.

TUTTLE Mfg. Co., H. A., So. Norwalk, Conn.

TUTTLE Mfg. Co., H. A., So. Norwalk, Conn.

GEAR WHEELS (Metal)

ADAPT Machinery Co. (The), 1624-30 Wabash Ave., Chicago, Ill.

ARTHUR Co. (The), 188 Front St., N. Y. City.

BOSTON Gear Works, Norfolk Downs, Mass.

BULTMAN Co., The F. H., 2108 Superior Ave., Viaduct, Cleveland, O.

DETROIT Screw Works, Detroit, Mich.
(See page 233.)

EBERHARDT Bros. Machine Co., 66-68 Union St., Newark, N. J.

FELLOWS Gear Shaper Co. (The), 23 Pearl St., Springfield, Vt.

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 231.)

HORSBURGH & Scott Co. (The), 5114 Hamilton Ave., Cleveland, O.

MUNCIE Auto Parts Co., 700 Elliott St., Muncie, Ind.

NEW Process Raw Hide Co., Syracuse, N. Y.
(See page 89.)

SIER-Bath Co., 143 W. 54th St., N. Y. City.

SPACKE Machine Co., The F. W., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.
(See page 65.)

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WARNER Gear Co., Muncie, Ind.

WIDMER Machine Works, 45-49 Fort St., E., Detroit, Mich.

WILLIAMS & Son, E. A., 107 Plymouth St., Jersey City, N. J.

GEAR WHEELS (Rawhide)

BOSTON Gear Works, Norfolk Downs, Mass.

CHICAGO Rawhide Mfg. Co., 75-77 Ohio St., Chicago, Ill.

HORSBURGH & Scott Co. (The), 5144 Hamilton Ave., Cleveland, O.

MUNSON Belt Co., Chas., 88 Franklin St., Chicago, Ill.

NEW Process Raw Hide Co., Syracuse, N. Y.
(see page opposite.)

NUTTALL Co., R. D., Fayette St. and Garrison Way, Pittsburg, Pa.

PICROME Hide Co., Syracuse, N. Y.
(See page opposite.)

SYRACUSE Rawhide Mfg. Co., Niagara and Shonnard Sts., Syracuse, N. Y.

WIDMER Machine Works, 45-49 Fort St., E., Detroit, Mich.

GENERATORS (Acetylene)

ACETYVONE Co., Niagara Falls, N. Y.

AMERICAN Auto Brass Co., 181 W. Maple St., Columbus, O.

AMERICAN Lamp Co., 125 Monroe Ave., Detroit, Mich.

ATWOOD Mfg. Co., Amesbury, Mass.

BADGER Brass Mfg. Co., Kenosha, Wis.

BRIDGEPORT Brass Co., Bridgeport, Conn.

BROWN Mfg. Co., J. B., Columbus, O.

CHICAGO Auto Lamp Works, 71 W. Jackson Blvd., Chicago, Ill.

DIETZ Co., R. E., 33 Laight St., New York.

ECO Mfg. Co., 53 State St., Boston, Mass.

EDMUNDS & Jones Mfg. Co., 315 Riopelle St., Detroit, Mich.

GRAY & Davis, Amesbury, Mass.

GRAY & Sons, Peter, 88-90 Union St., Boston, Mass.

HAUCK-Seebach Co., 291-295 Essex St., Brooklyn, N. Y.

HINE-Watt Mfg. Co., 60 Wabash Ave., Chicago, Ill.
(See page 87.)

KIMBALL Co., E. T., Motor Mart, Boston, Mass.

MANHATTAN Brass Co., 328 E. 28th St., New York City.

MANHATTAN Lamp Works, 530 W. 28th St., N. Y. City.

MILLER Mfg. Co., Peekskill, N. Y.

MOORE & Son, M. E., Westfield, Mass.

NEW York Coach & Auto Lamp Co., 794-98 10th Ave., N. Y. City.

PETERSON Mfg. Co., O. W., 1254 Michigan Ave., Chicago, Ill.
(See page 103.)

PINKUS, Frederick B., 103 Franklin St., New York.

PYLE Mfg. Co., 2211 Park Ave., Indianapolis, Ind.

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa.

RUSHMORE Dynamo Works, Plainfield, N. J.

SCOVILLE & Peck Co., New Haven, Conn.

STANDARD Lamp & Mfg. Co., 43 So. Canal St., Chicago, Ill.

TWENTIETH Century Mfg. Co., 17 Warren St., N. Y. City.

GENERATORS (Electric)

DAYTON Electrical Mfg. Co. (The), 87 St. Clair St., Dayton O.
(See page 113.)

ECK Dynamo Motor Co., Belleville, N. J.

EDDY Electric Mfg. Co. (The), Windsor, Conn.

ELBRIDGE Electric Co., Elbridge, N. Y.

ENGINEERING Specialty Co., Inc., 143 Liberty St., N. Y. City.

GENERAL Electric Co., Lynn, Mass.

HOLTZER-Cabot Electric Co. (The), Brookline, Mass.

LAMB Electric Co., 31 Canal St., Grand Rapids, Mich.

LINCOLN Electric Co. (The), 1232 E. 3d St., Cleveland, O.

MILWAUKEE Electric Co., Milwaukee, Wis.

NEW England Motor Co., Liberty Square, Lowell, Mass.

ROTH Bros. & Co., 27-29 S. Clinton St., Chicago, Ill.

SPRAGUE Electric Co., 527 W. 34th St., N. Y. City.

STERLING Electric Motor Co., Dayton, O.

WAGNER Electrical Mfg. Co., 4600 Plymouth Ave., St. Louis, Mo.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page 119.)

WRIGHT Co., Thomas, 406 Grand St., Jersey City, N. J.

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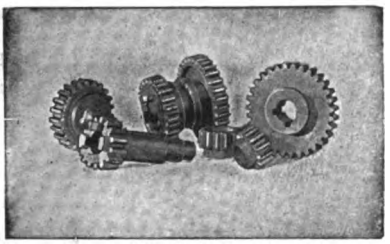

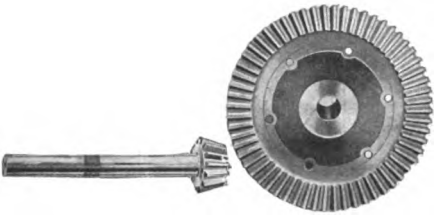

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(See Eye Shields)

GONGS

(See Bells)

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HOLMES Fibre Graphite Co., 5155 Wakefield St., Philadelphia, Pa.

NATIONAL Cement & Rubber Mfg. Co., 3053-59 Monroe St., Toledo, O.

OBERMAYER Co., The S., 641 Evans St., Cincinnati, O.

UNITED States Graphite Co., Saginaw, E. S., Mich.
(See page opposite.)

WISCONSIN Graphite Co., Allegheny, Pa.

GREASE

ACME Oil & Supply Co., 345 So. Canal St., Chicago, Ill.

AMERICAN Oil Co., 170-78 S. Water St., Jackson, Mich.

ANNIS Oil Co., N. L., 139 Potomac Ave., Buffalo, N. Y.

BAUM'S Castorine Co., Rome, N. Y.

BESLY & Co., C. H., 15-21 South Clinton St., Chicago, Ill.

BORNE, Scrymser Co., Claremont, N. J.

COLUMBIA Lubricants Co. of New York, 78 Broad St., New York.
(See page 131.)

DIXON Crucible Co., Jos., Wayne and Monmouth Sts., Jersey City, N. J.

DOWNING Grease Co., 14 Waltham St., Boston, Mass.

DRAPER Co., Walter H., 120 S. Railroad Ave., Mt. Vernon, N. Y.

EAGLE Oil & Supply Co., 104 Broad St., Boston, Mass.

ECONOMY Oil & Compound Co., 442 Clark St., Chicago, Ill.

EMERY Mfg. Co., 41 Main St., Bradford, Pa.

FISKE Bros. Refining Co., 13-15 Old Slip, New York.
(See page opposite.)

GALLAWAY, G. W., 322 Pearl St., N. Y. City.

HARRIS Oil Co., A. W., 330 S. Water St., Providence, R. I.
(See back cover.)

HAVOLINE Oil Co., 1906 Broadway, N. Y. City.

HAWS, Geo. A., 74 Pine St., N. Y. City.
(See page 133.)

KELLOGG & Co., E. H., 243-244 South St., N. Y. City.

KEYSTONE Lubricating Co., 20th and Allegheny Ave., Philadelphia, Pa.

MAGIE Bros., 9 N. Canal St., Chicago, Ill.

MILLER'S Sons, Wm. P., 73-79 Third St., Long Island City, N. Y.
(See page 223.)

MODOC Co. (The), Foot of Market St., Chester, Pa.

MONARCH Mfg. Co., Toledo, O.

MOUND City Oil & Supply Co., 203-05 North Levee, St. Louis, Mo.

NATIONAL Cement and Rubber Mfg. Co., 3053 Monroe St., Toledo, O.

NEW York & New Jersey Lubricant Co., 14 Church St., N. Y. City.

NORTHROP Lubricating Oil Co., 308 N. Commercial St., St. Louis, Mo.

PARAGON Refining Co. (The), Front St., Toledo, O.

PHILA. Grease Mfg. Co., The Bourse, Philadelphia, Pa.

PIGOT, Sayre & Co., 135 William St., N. Y. City.

RELIANCE Oil & Grease Co. (The), 1501 Columbus Road, Cleveland, O.

ROBINSON & Son Co., Wm., Baltimore, Md.
(See cover.)

Sheppard, W. S., 22 Lawrence St., Newark, N. J.
(See page 147.)

SPEAR'S Sons Co., The Alden, 369 Atlantic Ave., Boston, Mass.

STANDARD Oil Co., 26 Broadway, N. Y. City.

SULLIVAN Oil Co., 48 Wells St., Chicago, Ill.

SWEET, Charles F., 57-61 Market St., Hartford, Conn.

UNITED States Graphite Co., Saginaw, E. S., Mich.
(See page opposite.)

WISCONSIN Graphite Co. (The), 847 Division St., Stevens Point, Wis.

YOUNG, Orlando W., 180 Freylinghuysen Ave., Newark, N. J.
(See page 141.)

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Reduce friction, smooth out kinks and stop the squeaks. Put new life into old machines; give smoother, greater power to new ones.

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Petroleum makes the motor go,
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It has a high fire test, *will not carbonize* or gum, and is perfectly safe

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AMERICAN Lubricator Co., 93 Catherine St., Detroit, Mich.

BESLY & Co., Chas. H., 15-21 So. Clinton St., Chicago, Ill.

BOWEN Mfg. Co., 16 Canal St., Auburn, N. Y.
(See page opposite.)

DETROIT Lubricator Co., Lincoln Ave. and G. T. R. R., Detroit, Mich.

ERIE Stamping & Mfg. Co., Erie, Pa.

ESSEX Brass Co., G. B., 480 Franklin St., Detroit, Mich.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

LUNKENHEIMER Co. (The), Cincinnati, O.

PENBERTHY Injector Co., 220 Abbott St., Detroit, Mich.

POWELL Co., The Wm., 2525 Spring Grove Ave., Cincinnati, O.

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

SPENCE Mfg. Co., 279 Park St., Milwaukee, Wis.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WILLIAMS Valve Co., D. T., 521-23 Hunt St., Cincinnati, O.

WINKLEY Co. (The), 226 Abbott St., Detroit, Mich.

HAIR (Curled)

ARMOUR & Co., Chicago, Ill.

BAEDER, Adamson & Co., 67 Beekman St., N. Y. City.

BENTLEY Hair Co., Joseph, Methuen, Mass.

MITCHELL Co., The P. R., Spring Grove & Harrison Aves., Cincinnati, O.

HAMPERS

ATLAS Mfg. Co., Hampton, N. H.

BAILIE Basket Co., 85-87 Hudson St., Boston, Mass.

BOSTON Mat & Basket Co., 62 Fulton St., Boston, Mass.

BURLINGTON Basket Co., Burlington, Ia.

HEYWOOD Bros. & Wakefield Co., 174 Portland St., Boston, Mass.

M. & A. Basket Co., 239 E. 27th St., N. Y. City.

RATTAN Mfg. Co., 522 State St., New Haven, Conn.

RUMPP & Sons, C. F., 5th and Cherry Sts., Philadelphia, Pa.

SCHERER, Williams Co., 30 Lewis Wharf, Boston, Mass.

HEADLIGHTS
(See Lamps)

HEATERS (Auto)

CHICAGO Auto Heater Co., 285 N. State St., Chicago, Ill.

CHICAGO Flexible Shaft Co., La Salle Ave. and Ontario St., Chicago, Ill.

LEHMAN Bros., 10 Bond St., N. Y. City.

MOTOR Car Heater Co., 21 Quincy St., Chicago, Ill.

NOVELTY Mfg. Co., Jackson, Mich.

OLMSTED & Son, H. R., 413 S. Clinton St., Syracuse, N. Y.

PROGRESSIVE Mfg. Co., Pana, Ill.

STANDARD Stamping Co., Marysville, O.

HEATERS (Feed Water)

KILBURN, Edwin, Spring Valley, Minn.

NATIONAL Pipe Bending Co., New Haven, Conn.

NORRIS Mfg. Co., 27 Western Ave., Cambridge, Mass.

OFELDT & Sons, F. W., Nyack-on-the-Hudson, N. Y.

RANLET Automobile Co., St. Johnsbury, Vt.

WHITLOCK Coil Pipe Co. (The), Hartford, Conn.
(See page 145.)

HEATERS (Torch)

FOSTER & Brown, Westbrook, Me.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

MARION Co. (The), 123 Liberty St., N. Y. City.

WALLACE, W. M., 616 18th St., N. W., Washington, D. C.

HOLDERS (Watch)

COWLES & Co., C., Water and Chestnut Sts., New Haven, Conn.

ENGLISH & Mersick Co. (The), 70-74 Crown St., New Haven, Conn.

RUMPP & Sons, C. F., 5th and Cherry Sts., Philadelphia, Pa.

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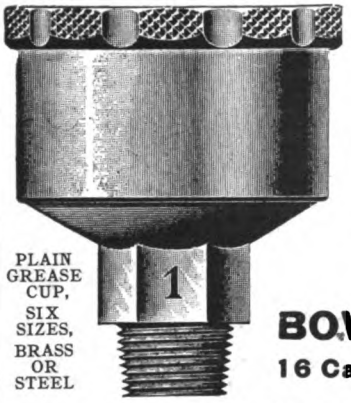

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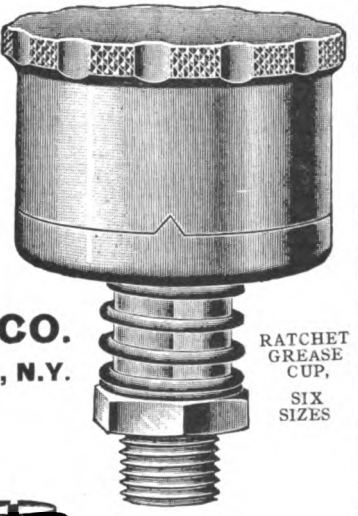

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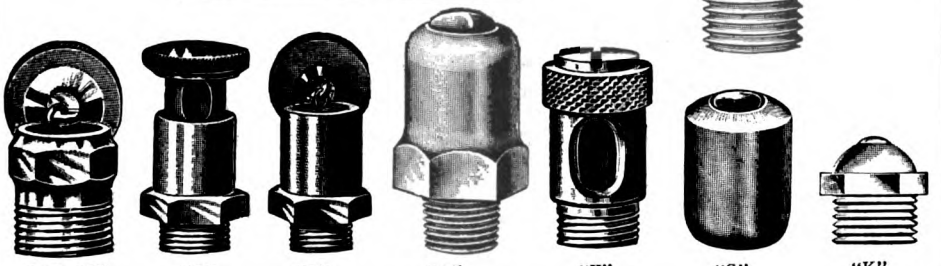

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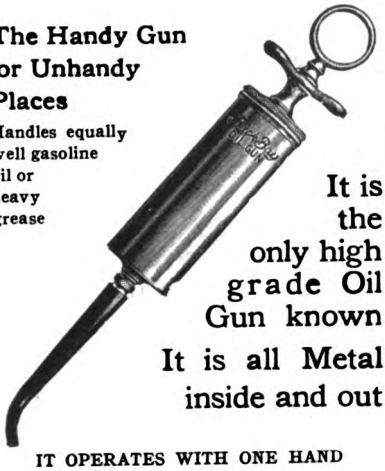

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IT OPERATES WITH ONE HAND
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"OIL-RIGHT" is self-filling.

Will save its own cost and increase the efficiency of the car.

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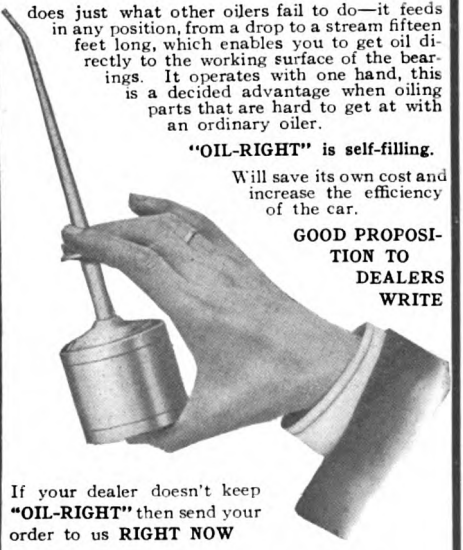

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AMESBURY Metal Body Co., Clark and Elm Sts., Amesbury, Mass.

A-Z Co. (The), 527 W. 56th St., N. Y. City.

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J.
(See page 145.)

DETROIT Auto Specialty Co., 909-911 Greenwood Ave., Detroit, Mich.
(See page 73.)

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

FEDDERS Mfg. Works, Buffalo, N. Y.
(See page 175.)

HAYES Mfg. Co., 360-370 Maybury Ave., Detroit, Mich.
(See page 73.)

KELLS Mfg. Co., W. J., 60-62 Van Winkle Ave., Jersey City, N. J.

KEYSTONE Wagon Works, Reading, Pa.

KINSEY Mfg. Co., 1126 E. 3d St., Dayton, O.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

LONG-Turney Mfg. Co., Rome, N. Y.

MAYO Radiator Co., New Haven, Conn.
(See page 145.)

MOORE & Munger Co., 602 W. 52d St., N. Y. City.

MULLINS Co., The W. H., Salem, O.

OFF & Co., Christian, Indianapolis, Ind.

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

SPRINGFIELD Metal Body Co., 397 Birnie Ave., Brightwood, Mass.
(See page 235.)

WHITLOCK Coil Pipe Co. (The), Hartford, Conn.
(See page 145.)

WRIGHT Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill.

HORN SCREENS

MANHATTAN Screw & Stamping Works, 67th St. and West End Ave., N. Y. City.

TYLER Co., The W. S., 3618 St. Clair Ave., N. E., Cleveland, O.

HORNS

ACORN Brass Mfg. Co., Green, Fulton and Peoria Sts., Chicago, Ill.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 103.)

AUTOLYTE Mfg. Co., 10-12 Thomas St., N. Y. City.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers).
(See page 191.)

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 87.)

AUTOMOBILE Supply Mfg. Co., 139-47 Emerson Place, Brooklyn, N. Y.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 69.)

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers).
(See page 71.)

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 77.)

GLEASON-Peters Air Pump Co., Mercer and Houston Sts., N. Y. City.

HUTCHINSON Electric Horn Co., 1 Madison Ave., N. Y. City.

MANHATTAN Screw & Stamping Works, 67th St. and West End Ave., N. Y. City.

MILLER, Charles E., 97-101 Reade St., New York City (Importer).

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 101.)

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers).
(See page 239.)

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers).
(See page 99.)

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers).
(See page 205.)

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers).
(See page opposite.)

RILEY-Klotz Mfg. Co., 17 Mulberry St., Newark, N. J.

RUBAY, Leon, 1697 Broadway, N. Y. City (Importer).

SCHOENING, M. E., 369 Broadway, New York City (Importer).

STEVENS & Co., 99 Chambers St., N. Y. City (Jobbers).

STEWART & Clark Mfg. Co., 514 Diversey Blvd., Chicago, Ill.
(See page 25.)

VESTA Accumulator Co., 1336 Michigan Ave., Chicago, Ill.

WEISS, Louis T., 286 Taaffe Place, Brooklyn, N. Y.

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AMERICAN Motor Parts Co., 21-23-25 Plymouth Court, Chicago, Ill.
(See page 113.)

APPLIANCE Mfg. Co., 72-86 West Jackson Blvd., Chicago, Ill.
(See page 49.)

GABRIEL Horn Mfg. Co., 1407 E. 40th St., N. E., Cleveland, O.

GRAY-Hawley Mfg. Co., 605-609 Fort St., W., Detroit, Mich.

NEW Jersey Tube Co., Kingsland Ave., Harrison, N. J.

NEW York Coach & Auto Lamp Co., 794-98 10th Ave., N. Y. City.

ROSS Engineering Co., 19 So. Jefferson St., Chicago, Ill.

SCHOENING, M. E., 369 Broadway, N. Y. City (Importer).

TRINITY Chimes Co. (The), 29 N. Capitol Ave., Indianapolis, Ind.

UNCAS Specialty Co., 25 Shipping St., Norwich, Conn.

WATRES Mfg. Co., 1133 Broadway, N. Y. City.

BOWEN Mfg. Co., 16 Canal St., Auburn, N. Y.
(See page 93.)

CROSBY Co. (The), Buffalo, N. Y.
(See page 167.)

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 231.)

IMPERIAL Brass Mfg. Co., 247 So. Jefferson St., Chicago, Ill.

KONIGSLOW Mfg. Co., Otto., Cleveland. Ohio.
(See page 49.)

NIAGARA Falls Brass Works, Inc., Niagara and Virginia Sts., Buffalo, N. Y.
(See page 57.)

STANDARD Welding Co. (The), Cleveland, O.

TORREY Roller Bushing Works, Bath, Me.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

HOUSES (Portable)

AMERICAN Portable House Co., Seattle, Wash.

BURNHAM-Standeford Co., Oakland, Cal.

CHICAGO Portable House Co., 4726 Shields Ave., Chicago, Ill.

DUCKER Co., New York, N. Y.

HODGSON, E. F., Dover, Mass.

HOLLIS, Park & Pollard, 28-30 Canal St., Boston, Mass.

KARR Portable House Co., 605 Bellplaine Ave., Chicago, Ill.

KEASBY & Mattison Co., Ambler, Pa.

MERSHON & Morley Co., Saginaw, Mich.

NATIONAL Construction Co., 604 Morgan Bldg., Buffalo, N. Y.

PHENIX Mfg. Co., Milwaukee, Wis.

SPRINGFIELD Portable Construction Co., 58 Waltham Ave., Springfield, Mass.

WATERMANN-Hunter Co., 515 1st Ave., So., N. E., Minneapolis, Minn.

WYCKOFF Lumber & Mfg. Co., Ithaca, N. Y.

HUB FLANGES

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O.
(See page 223.)

BOSTON Pressed Metal Co., 171-73 Union St., Worcester, Mass.

CROSBY Co. (The), Buffalo, N. Y.
(See page 167.)

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 221.)

HYDRAULIC Pressed Steel Co., Cleveland, O.
(See cover.)

KEIM Mills, Inc., John R., Liberty St. and Kensington Ave., Buffalo, N. Y.

KONIGSLOW Mfg. Co., Otto, Cleveland. Ohio.
(See page 49.)

STANDARD Welding Co. (The), Cleveland, O.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

HUB CAPS

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O.
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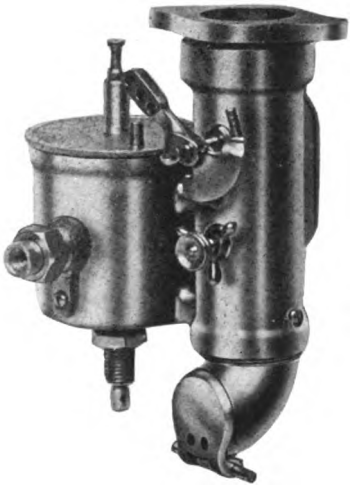

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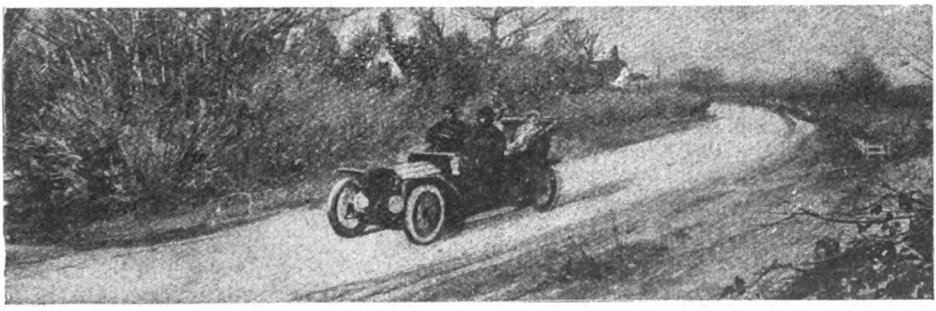

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AUBURN Ball Bearing Co., Rochester, N. Y.

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GARFORD Co. (The), Elyria, O.

IMPERIAL Steel Co. (The), 218 Front St., Fremont, O.

JAMESVILLE Mfg. Co., Jamesville, N. Y.

KEIM Mills, Inc., John R., Liberty St. and Kensington Ave., Buffalo, N. Y.

SMITH Co., A. O., Milwaukee, Wis.

STANDARD Roller Bearing Co., 48th St. and Girard Ave., Philadelphia, Pa.

STANDARD Welding Co. (The) Cleveland, O.

TIMKEN Roller Bearing Axle Co., Canton, O.

WESTON-Mott Co., Flint, Mich.

HYDROMETERS

ADAMS, A. L., 45 Salem St., Worcester, Mass.

AMERICAN Thermo-Ware Co., 16 Warren St., N. Y. City (Importers).

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers). (See page 103.)

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers). (See page 191.)

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers. (See page 87.)

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers). (See page 69.)

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers). (See page 71.)

FRANCO-American Auto & Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers). (See page 77.)

GREINER Co., The Emil, 45 Cliff St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers). (See page 101.)

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers). (See page 239.)

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers). (See page opposite.)

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers). (See page 205.)

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers). (See page 95.)

SCIENTIFIC Shop (The), 1230 Monon Bldg., Chicago, Ill.

SCHEIDIG & Co., 50 Maiden Lane, N. Y. City.

STORAGE Battery Supply Co. (The), 239 E. 27th St., N. Y. City.

TAYLOR Bros. Co., Rochester, N. Y.

VUILLE, Chas. A., Huntington, Pa.

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(See Wire, Insulated)

IGNITION DYNAMOS

(See Magnetos and Ignition Dynamos)

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(See Gauges, Gasoline Tank)

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(Speed, Distance and Time)
(See Speedometers)

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CARNEGIE Steel Co., Pittsburg, Pa.

GALVANIZING Co. (The), 525 N. Front St., Philadelphia, Pa.

LOCKHART Iron & Steel Co., McKee's Rocks, Pa.

PASSAIC Steel Co., Passaic, N. J.

PENNSYLVANIA Steel Co., Steelton, Pa.

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AMERICAN Steel Hoop Co., Pittsburg, Pa.

BRAEBURN Steel Co., Braeburn, Pa.

CARNEGIE Steel Co., Pittsburg, Pa.

COLUMBIA Bridge Co., Pittsburg, Pa.

CRUCIBLE Steel Co. of America, Empire Bldg., Pittsburg, Pa.

DIAMOND State Steel Co., Wilmington, Del.

GALVANIZING Co. (The), 525 N. Front St., Philadelphia, Pa.

LOCKHART Iron & Steel Co., McKees Rocks, Pa.

LOGAN Iron & Steel Co., Burnham, Pa.

NATIONAL Steel Co., Pittsburg, Pa.

PENNSYLVANIA Steel Co., Steelton, Pa.

PHOENIX Iron Co., Phoenixville, Pa.

REPUBLIC Iron & Steel Co., Stock Exchange Bldg., Chicago, Ill.

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AMERICAN Sheet Steel Co., 24 State St., N. Y. City.

AMERICAN Steel & Wire Co., The Rookery, Chicago, Ill.

BASSETT-Pressley Co., Western Reserve Bldg., Cleveland, O.

CANONSBURG Iron & Steel Co., Pittsburg, Pa.

LA BELLE Iron Works, Steubenville, O.

McCULLOUGH Iron Co., Wilmington, Del.

MARYLAND Sheet & Steel Co., Cumberland, Md.

TAYLOR Co., N. & G., 308 Chestnut St., Philadelphia, Pa.

WAUKESHA Sheet Steel Co., Waukesha, Wis.

YOUNGSTOWN Sheet & Tube Co., Youngstown, O.

JACKS

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 103.)

AUTOBED Co. (The), Boston, Mass.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers).
(See page 191.)

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 87.)

BARTH Mfg. Co., 348 Milwaukee St., Milwaukee, Wis.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 69.)

BERGER Co., Joseph, 310-20 Hart St., Dayton, O.

BICYCLE Step Ladder Co. (The), 63 Randolph St., Chicago, Ill.

BUCKEYE Jack Mfg. Co., Louisville, O.

BUDA Foundry & Mfg. Co., Chicago, Ill.

CAPITAL Auto Co., 130-32 E. New York St., Indianapolis, Ind.

COOK'S Standard Tool Co., Kalamazoo, Mich.

COVERT Mfg. Co., Watervliet, N. Y.

DUFF Mfg. Co., Pittsburg, Pa.

EUREKA Mower Co., Utica, N. Y.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers).
(See page 71.)

FERODOWILL Mfg. Co., St. Paul, Minn.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chcago, Ill. (Dealers and Jobbers).
See page 77.)

GARLICK Auto. Prop Co., Madison Ave. and Broadway, Paterson, N. J.

JERSEY Brake Co., 93 Green St., Newark, N. J.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

MAXWELL & Co., L. R., Cedar Rapids, Ia.

MILLER Mfg. Co., Peekskill, N. Y.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page opposite.)

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers).
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NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers).
(See page 205.)

OLIVER Mfg. Co., 203 So. Desplaines St., Chicago, Ill.

OSBORNE Pole & Shaft Co., Anderson, Ind.

PATTERSON, Gottfried & Hunter, Ltd., 146-150 Centre St., N. Y. City.

POPE Mfg. Co., Hartford Conn. (Dealers and Jobbers).
(See page 95.)

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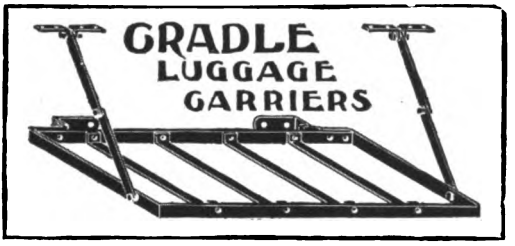
We make a specialty of

Spark Coil Parts and Platinum Points

AND DO EXPERT COIL REPAIRING IN ALL ITS BRANCHES

See illustrations of a few parts on margins



LUGGAGE CARRIER (All Steel, No Castings)

No tourist has his car quite Complete without a Luggage Carrier. Its convenience appeals to every owner who takes country runs. A couple of suit cases, a small trunk or bundles, can be strapped on in a moment. They are easily adjusted to any car with ordinary tools.

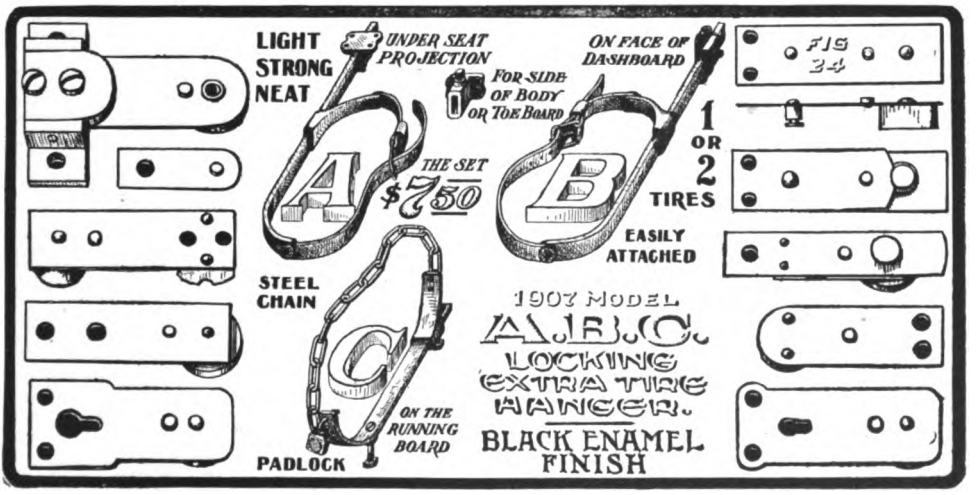
The price complete, black japanned, is ONLY $9.00, which is very reasonable for the article.

In ordering "Cradle" Luggage Carriers give the width of body if you wish it set above the spring hangers; if you wish it hung as shown in cut, give the distance between the spring hangers. Write for discount.

NEW CATALOGUE ON THE PRESS
WRITE FOR IT

THE MOTOR CAR SUPPLY CO.

1425 and 1427 Michigan Ave. CHICAGO, ILL.



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ROTH Jack and Tool Co., 68 William St., N. Y. City.

SHAW Engineering & Mfg. Co., 216 High St., Newark, N. J.

SHAWVER Co., Springfield, O.

SMITH & Heminway, 296 Broadway, N. Y. City.

STANDARD Tool Co., 432 Harrison St., Kalamazoo, Mich. (See page 251.)

TRENTON Malleable Iron Co. (The), New York Ave., Trenton, N. J.

UNITED States Jack Co., 128-30 W. Lake St., Chicago, Ill.

WHIPPLE, R. W., 169 State St., Binghamton, N. Y.

LAMP BRACKETS

AMERICAN Motor Parts Co., 21-23-25 Plymouth Court, Chicago, Ill. (See page 113.)

CRAMP & Sons' Ship & Engine Building Co., Wm., Philadelphia, Pa.

CROSBY Co. (The), Buffalo, N. Y. (See page 167.)

DOUGLAS & Lomason Co., 306 Grand River Ave., Detroit, Mich.

DUANE Co., W. J., 304 W. 54th St., N. Y. City.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O. (See page 69.)

HARPER Co., Walter J., 229-31 Mulberry St., Newark, N. J.

KELLY Handle Bar Co., Cleveland, O.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio. (See page 49.)

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (See page 101.)

OHIO Brass Co., Mansfield, O.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (See page 139.)

STANDARD Welding Co. (The), Cleveland, O.

LAMP BRACKETS (Adjustable)

DOUGLAS & Lomason Co., 306 Grand River Ave., Detroit, Mich.

HALDERMAN, O. A., Marion, Ind.

HAM Mfg. Co., C. T., 137 Oak St., Rochester, N. Y. (See page 105.)

IMPERIAL Brass Mfg. Co., 247 So. Jefferson Ave., Chicago, Ill.

NEW York Coach & Auto Lamp Co., 794-98 10th Ave., N. Y. City.

NORTHWAY, Thomas J., 102 Exchange St., Rochester, N. Y. (See page 76.)

PYLE Mfg. Co., 2211 Park Ave., Indianapolis, Ind.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

LAMP COVERS

ALLEN Auto Specialty Co., 1931 Broadway, N. Y. City.

BRIDGEPORT Vehicle Co., South Ave. and Main St., Bridgeport, Conn.

EMPIRE Rubber Co., 115-117 Worth St., N. Y. City.

FICKLING & Co., Inc., 154 E. 57th St., N. Y. City.

GIFFORD & Son, John A., 25 Park Place N. Y. City.

GILBERT Mfg. Co., New Haven, Conn. (See page 31.)

HARPER Co., J. Walter, 229-231 Mulberry St., Newark, N. J.

LONDON Auto Supply Co., 1229 Michigan Ave., Chicago, Ill. (See page 189.)

NATHAN Novelty Mfg. Co., 88-90 Reade St., N. Y. City.

NEW York Motor Fabric Co., 32 Union Sq., N. Y. City.

VEHICLE Apron and Hood Co., Columbus, O

VEHICLE Top & Supply Co., 900-02 Cass Ave., St. Louis, Mo. (See page 191.)

WILEY & Son Co., Wm. H., Hartford, Conn.

LAMP LIGHTING DEVICES

PINKUS, Frederick B., 103 Franklin St., N. Y. City.

ROLFE-Fox Company, 407 N. Livingston Bldg., Rochester, N. Y. (See page opposite.)

LAMP REFLECTORS

BAUSCH & Lomb Optical Co., Rochester, N. Y.

MACBETH-Evans Glass Co., Pittsburg, Pa.

MATISSE Mfg. Co., 411-13 East 107th St., N. Y. City.

SCHEIDIG & Co., John, 50 Maiden Lane, N. Y. City.

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The Auto-Light

Lights your lamps from the seat any time, anywhere, in any weather. No more fussing with matches; simply throw the lever. No automobile accessory has ever been devised that will give you more comfort and convenience.

"This new lamp lighter is a great thing"
New York Herald, March 17, 1907

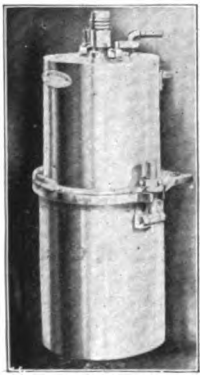
Simple, compact. Attached by anyone in 30 minutes

Cannot get out of order

Write for new booklet

Rolfe-Fox Company

407N Livingston Building
ROCHESTER, N. Y.



The Peterson New Automatic is the only Carbide Generator on the market which has

1. A positive, **automatic** mechanical control of the water feed secured by a needle valve and diaphragm.
2. The valve, water passageway, and all mechanism contained in one easily removed fitting.
3. An **Automatic** tossing carbide basket which continually rotates the fresh carbide to the top and the used carbide down next to the grate where the waste is eliminated.
4. The **same pressure** on the **top** of the water as in the generating chamber without a bothersome vent hole.
5. An ideal filter **independent** of the rest of the generator which is absolutely unfailing in purifying the gas. *Write for a catalog.*

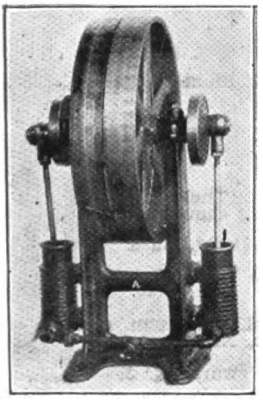
O. W. Peterson Manufacturing Co.

GENERAL SALES OFFICE:

1254 Michigan Ave., CHICAGO, U. S. A.

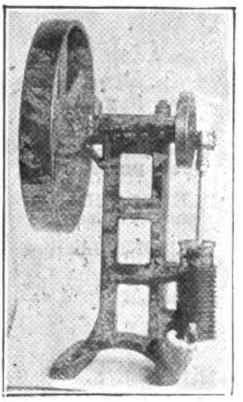
THE HITS OF THE SEASON

OUR STAR PUMPS are built to stand all kinds of hard usage, as all bearings can be tightened and taken up at any time· crank pins are all hardened and will wear a lifetime. Our low price on these pumps is no criterion of the quality.



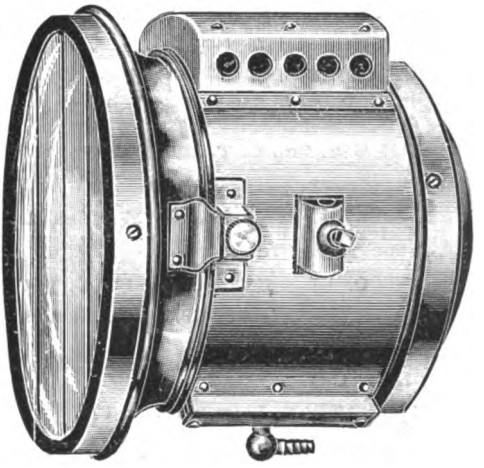
STAR A PUMP
With Tight and Loose Pulleys

This pump has two cylinders 2 7-16 with a 5-inch stroke and has a capacity of pumping up to 200 pounds pressure in tank of 120 gallons per hour at 125 R. P. M. It is made like our Style B Pump. Only has two cylinders. This pump is to be desired where a big volume of air is needed.



STAR B, With Tight Pulley or Tight and Loose Pulley

This pump is made like a gas engine, using two steel rings on piston cylinder and piston ground to fit; has a pumping capacity of 125 pounds at 125 R. P. M. in 80-gallon tank in 40 minutes. This pump will last a lifetime as it has nothing to wear or get out of order. Cylinder is 2 7-16 and stroke 5 inches.



CENTURY LAMPS

Century No. 77 Rushmore Type Lamp is one of the many popular styles of Century Lamps which scored phenomenal success at the late Automobile Show held in Chicago.

Write for our complete and up-to-date Automobile Accessory Catalogue.

EUGENE ARNSTEIN, 35th St. & Shields Ave., Chicago, U.S.A.

Exclusive Distributers of Century Lamps and Star Power Pumps

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LAMPS

ABEL Mfg. Co., 1112 Great Northern Bldg., Chicago, Ill.

AMERICAN Auto Brass Co., 181 W. Maple St., Columbus, O.

AMERICAN Lamp Co., 125 Monroe Ave., Detroit, Mich.

AMERICAN Lamp Wks., 62 West 43d St., N. Y. City.

ATWOOD Mfg. Co., Amesbury, Mass.

AUTOLYTE Mfg. Co., 10-12 Thomas St., N. Y. City.

AUTOMOBILE Supply Mfg. Co., 139-47 Emerson Place, Brooklyn, N. Y.

BADGER Brass Mfg. Co., Kenosha, Wis.

BROWN Mfg. Co., J. B., Columbus, O.

CARLISLE & Finch Co. (The), 229-31 E. Clinton Ave., Cincinnati, O.

CHICAGO Auto Lamp Works, 71 W. Jackson Blvd., Chicago, Ill.

CORCORAN Lamp Co. (The), 1712 Reading Road, Cincinnati, O.
(See page opposite.)

COWLES & Co., C., Water and Chestnut Sts., New Haven, Conn.

DAYTON Mfg. Co., 2240 E. 3d St., Dayton, Ohio.

DIETZ, R. E. Co., 33 Laight St., N. Y. City.

DU BOIS Searchlight Co., 220 Broadway, N. Y. City.

ECO Mfg. Co., 53 State St., Boston, Mass.

EDMUNDS & Jones, 315 Riopelle St., Detroit, Mich.

ENGLISH & Mersick Co. (The), 70-74 Crown St., New Haven, Conn.

GRAY & Davis, Amesbury, Mass.

GRAY, Peter & Sons,, 88-90 Union St., Boston, Mass.

HAM Mfg. Co., C. T., 137 Oak St., Rochester, N. Y.
(See page opposite.)

HINE-Watt Mfg. Co., 60 Wabash Ave., Chicago, Ill.
(See page 87.)

HOLCOMBE & Co., 45 Vesey St., N. Y. City.

LOCKWOOD Co. (The), 34 Mechanic St., Newark, N. J.

MANHATTAN Brass Co., 328 E. 28th St., N. Y. City.

MANHATTAN Lamp Works, 530 W. 28th St., N. Y. City.

MANHATTAN Screw & Stamping Works, 67th St. and West End Ave., N. Y. City.

MILLER Mfg. Co., Peekskill, N. Y.

NEW York Coach & Auto Lamp Co., 794-798 10th Ave., N. Y. City.

NORTHWESTERN Storage Battery Co., 448 Milwaukee St., Milwaukee, Wis.

OHIO Electric Works, 6304 Ellen Ave., N. W., Cleveland, O.

PYLE Mfg. Co., 2211 Park Ave., Indianapolis, Ind.

ROSE Mfg. Co., 910 Arch St., Phila., Pa.

ROYAL Battery Co., 108-10 Duane St., N. Y. City.
(See page 7.)

RUBAY, Leon, 1697 Broadway, N. Y. City (Importer).

RUSHMORE Dynamo Works, Plainfield, N. J.

SCOVILLE & Peck Co., New Haven, Conn.

STANDARD Lamp & Mfg. Co., 43 So. Canal St., Chicago, Ill., and Charlotte, Mich.

TWENTIETH Century Mfg. Co., 17 Warren St., N. Y. City.

VESTA Accumulator Co., 1336 Michigan Ave., Chicago, Ill.

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

LAMPS (Water Glass)

AMERICAN Electrical Novelty Co., 308 Hudson St., N. Y. City.

DIETZ Co., R. E., 33 Laight St., N. Y. City.

LEATHER

AMERICAN Oak Leather Co., Cincinnati, O.

AMERICAN Oak Leather Co., 176 South St., Boston, Mass.

ASHTABULA Hide & Leather Co., Astabula, Ohio.

CAFFREY Leather Co., M., Frelinghuysen Ave. and Meeker St., Newark, N. J.

CARR, F. S., 74 Pearl St., Boston, Mass.
(See page 149.)

CHASE Co., L. C., New York, Chicago and Boston.
(See page 187.)

CLEVELAND Tanning Co. (The), Jennings and Dennison Ave., S. W., Cleveland, O.

DIAMOND Leather Co., Peabody, Mass.

DUSENBURY, Louis, 86-88 Worth St., New York, N. Y.

HALSEY & Smith, J. H., Shipman and Springfield Ave., Newark, N. J.

HOWELL & Co., T. P., Newark, N. J.

LACKAWANNA Leather Co. (The), Hackettstown, N. J.

McCORMICK & Sons, E. H., Ave. C and Vanderpool St., Newark, N. J.

PATENT Leather Co. of America (The), 48 Sheffield St., Newark, N. J.

RADEL Leather Mfg. Co., Hamburg Place Road, Newark, N. J.

RASER Tanning Co., Ashtabula, O.

REILLY & Son Corp., P., Newark, N. J.

REX Imperial Leather Co., 16 Chapel St., Newark, N. J.

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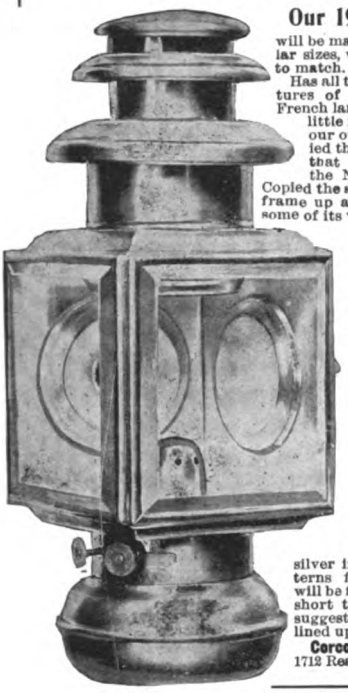
CORCORAN'S FRENCH SQUARE OIL SIDE LAMP



Our 1907 Leader

will be made in two popular sizes, with Tail Lights to match.

Has all the desirable features of the high-priced French lamps, with a few little improvements of our own. Yes, we copied the French lamps that were shown at the New York Show. Copied the style and general frame up and improved on some of its weak points, and now CORCORAN is "IT" on square lamps if anybody should ask you. These French lamps were being priced at as high as $70.00 per pair at the New York Show, and we haven't got the nerve to ask $10.00 per pair. (We have an awfully low price—write.)

Elegant, well made, highly finished, and out of good, heavy-gauge brass. Solid brass outside, silver inside. Our patterns for these lamps will be finished in a very short time and would suggest that you get lined up for samples.

Corcoran Lamp Co.
1712 Reading Road
Cincinnati, Ohio

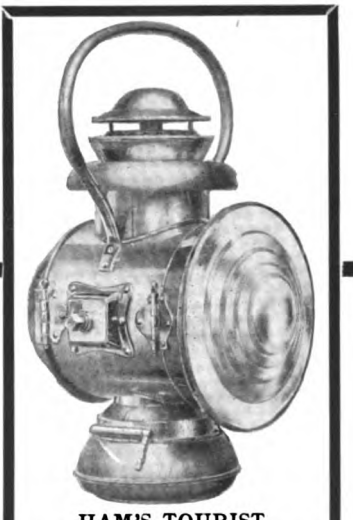
HAM'S ROCHESTER

The Beauty in Automobile Lamps

is not alone in the appearance, but in the burning qualities and construction as well, which are even more vital points. Ham's Lamps are a combination of Beauty and strength combined with our original "Cold Blast" principle which insures a perfect bright light that you can always depend on They have a rear door and detachable oil fount making all parts easy of access for cleaning.

Write for our New Auto Booklet.

C. T. Ham Mfg. Co.
137 Oak St., ROCHESTER, N. Y.



HAM'S TOURIST

1908

BIG 4 PLUG

Only Plug on the market today making four fires at one and same time. Special grade of wire which will not scale, corrode, or open.

We use our new insulation called **Belleeko Porcelain,** one which is better than Mica, Lava or Porcelain.

Our insulation will not absorb or break easily under extreme heat.

Our plug can be taken apart and cleaned in five seconds.

Write for Prices, Agencies and Folders.

BIG 4 SPARK PLUG CO.

104 John R St. Tel. M2003-J. **DETROIT, MICH.**

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ROEHM & Davison, Ltd., Woodbridge and Wayne Sts., Detroit, Mich.

SMITH, Hugh, 210 Central Ave., Newark, N. J.

STANDARD Leather Co., 296 Spring Garden Ave., Allegheny, Pa.

STENGEL & Rothschild, Kossuth and Berlin St., Newark, N. J.

TERWILLIGER-Stone Leather Co., 210 N. J. R. R. Ave., Newark, N. J.

WARD & Co., E. S., Waverly, Newark, N. J.

WHITCHER & Co., Frank W., 14 Albany St., Boston, Mass.

WOLVERINE Leather Goods Co., 59 E. Fort St., Detroit, Mich.

LEATHER (Artificial)

BOSTON Artificial Leather Co., 308 4th Ave., N. Y. City.

CARR, F. S., 74 Pearl St., Boston, Mass. (See page 149.)

FABROKOID Co. (The), Newburgh, N. Y.

MUTTY Co., L. J., 28 Summer St., Boston, Mass. (See page 149.)

PANTASOTE Co. (The), 11 B'way, N. Y. City. (See page opposite.)

WHITCHER & Co., Frank W., 14 Albany St., Boston, Mass.

LEATHER (Friction)

REPUBLIC Belting & Supply Co., Cleveland, O. (See page 75.)

LEGGINS
(See Wearing Apparel)

LEVERS

AMERICAN & British Mfg. Co., Bridgeport, Conn.

ATLAS Drop Forge Co., Lansing, Mich.

CRAMP & Sons' Ship & Engine Building Co., Wm., Philadelphia, Pa.

GARFORD Co. (The), Elyria, O.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio. (See page 49.)

LEE Mfg. Co. (The), Port Huron, Mich.

LIGHT Mfg. & Foundry Co., Union and Queen Sts., Pottstown, Pa. (See page 85.)

LOCKE Regulator Co., 76 North St., Salem, Mass.

LONG Arm System Co., Cleveland, O.

MUNCIE Auto Parts Co., 700 Elliott St., Muncie, Ind.

READING Automobile Co., 26 S. 5th St., Reading, Pa.

SMITH Co., A. O., Milwaukee, Wis.

STANDARD Welding Co. (The), Cleveland, O.

SYRACUSE Aluminum & Bronze Co., 530 Leavenworth Ave., Syracuse, N. Y. (See pages 27 and 53.)

WABASH Gear Works, Terre Haute, Ind.

WARNER Gear Co., Muncie, Ind.

WORCESTER Pressed Steel Co., Greendale, Mass. (See page 143.)

LICENSE NUMBERS

ALUMINUM Mfg. Co., Two Rivers, Wis.

BALTIMORE Enamel & Novelty Co., foot of Allen St., Baltimore, Md.

BOYLE & Co., John, 112-14 Duane St., N. Y. City.

CHANDLER Co. (The), 31 Taylor St., Springfield, Mass.

CHILDS & Co., S. D., 200 S. Clark St., Chicago, Ill.

FINE, Horace E., Trenton, N. J.

GREACON & Co., Walter, 12 Mechanic St., Newark, N. J.

McKINNON Dash Co., Buffalo, N. Y.

MONOGRAM Crest & Sign Co., 1937 Broadway, N. Y. City.

MORSE & Son, C. H., 15 S. Water St., Rochester, N. Y.

MURDOCK Co., Jas., Jr., 116 Opera Place, Cincinnati, O.

NEW Jersey Aluminum Co., 701 Springfield Ave., Newark, N. J. (See page 21.)

NOONAN Tool & Machine Works, 105 E. Dow St., Rome, N. Y.

REES, F. H., Steele Memorial Bldg., Elmira, N. Y.

ROBBINS Mfg. Co., John, 58 Kneeland St., Boston, Mass.

STAFFORD Co., N., 67 Fulton St., N. Y. City.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill. (See page 83.)

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NOTICE

IT HAS BEEN BROUGHT TO OUR ATTENTION

That certain unscrupulous dealers and top makers have been offering to the trade and public, Automobile Tops made of cheap, inferior leather substitutes, representing them as

PANTASOTE

¶The name **PANTASOTE** represents a particular composition, which is, and for years has been, manufactured exclusively by us. It is thoroughly protected by copyright. We do not desire to create trouble, but for the protection of our own business, as well as that of our customers, are forced to give notice that we will follow up and **PROSECUTE TO THE FULL EXTENT OF THE LAW** all such cases as come to our notice.

¶If you are in doubt about the genuineness of the Pantasote, request your dealer to affix one of our trade-mark labels to the top or send us a small sample, or one of the side curtains.

TO DEALERS:

We are prepared to furnish upon application, free of charge, small celluloid trade-mark labels, one of which affixed to a Pantasote top stamps its genuineness.

The Pantasote Company

NEW YORK, 11 Broadway

CHICAGO, 707 Fisher Bld'g

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LOCKERS

ART Metal Construction Co., Jamestown, N. Y.

DARBY & Sons Co., Edward, 233 Arch St., Philadelphia, Pa.

MERRITT Co., 1045 Ridge Ave., Phila., Pa.

OHNSTRAND Metal Furniture Co., Jamestown, N. Y.

LUBRICANTS

(See Oils and Greases)

LUBRICATORS

AMERICAN Injector Co., Detroit, Mich.

AMERICAN Lubricator Co., 93 Catherine St., Detroit, Mich.

BAY State Stamping Co., 380 Chandler St., Worcester, Mass.

BENHER Motor Co., 120 Randolph St., Chicago, Ill.

BOWEN Mfg. Co., 16 Canal St., Auburn, N. Y.
(See page 93.)

CHARTER & Co., 303 Dearborn St., Chicago, Ill.

DETROIT Lubricator Co., Lincoln Ave. & G. T. R. R., Detroit, Mich.

DODGE Lubricator Co., 8 Waltham St., Boston, Mass.

ELEVATOR Supply & Repair Co., 76 W. Monroe St., Chicago, Ill.

ESSEX, G. B., Brass Co., 480 Franklin St., Detroit, Mich.

FRASSE Co. (The), 38 Cortlandt St., N. Y. City.

GREENE, Tweed & Co., 109 Duane St., N. Y. City.

HANCOCK Mfg. Co., 770 E. Henry St., Charlotte, Mich.
(See page 111.)

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

IMPERIAL Brass Mfg. Co. (The), 247 So. Jefferson St., Chicago, Ill.

KINSEY Mfg. Co., 1126 E. 3d St., Dayton, O.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio.
(See page 49.)

LAVIGNE Mfg. Co., Detroit, Mich.

LEE Injector Co. (The), Port Huron, Mich.

LUNKENHEIMER Co. (The), Cincinnati, O.

McCANNA Mfg. Co., 56 N. Jefferson St., Chicago, Ill.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 11.)

MADISON-Kipp Mfg. Co., Madison, Wis.

MANZEL Bros. Co., 313 Babcock St., Buffalo, N. Y.
(See page 110.)

McRAE & Roberts Co. (The), 227-235 Campbell Ave., Detroit, Mich.

MICHIGAN Lubricator Co., 661 Beaubien St., Detroit, Mich.

NATIONAL Sewing Machine Co., Belvidere, Ill.

NEELY, Edward, 244 Wells St., Chicago, Ill.

NOERA Mfg. Co., Waterbury, Conn.

OHIO Brass Co., Mansfield, O.

PEDERSEN Mfg. Co., 400-412 East 37th St., N. Y. City.
(See page opposite.)

PENBERTHY Injector Co., 22 Abbot St., Detroit, Mich.

POWELL Co., The Wm., 2525 Spring Grove Ave., Cincinnati, O.

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill.
(See page 135.)

REDINGTON Co., F. B., 107 S. Sangamon St., Chicago, Ill.

SCHOELKOPF Mfg. Co., Madison, Wis.

SHERWOOD Mfg. Co., Elmwood Ave. and Belt Line, Buffalo, N. Y.

STANDARD Automobile Lubricator Co., 361-363 Ellicott St., Buffalo, N. Y.
(See page 111.)

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

WILLIAMS Valve Co., D. T., 521-23 Hunt St., Cincinnati, O.

WINKLEY Co. (The), 226 Abbott St., Detroit, Mich.

MACHINERY

(Special Automobile)

ADAMS Co. (The), Dubuque, Iowa.

BAKER Bros., Westlake and Post Sts. and M. C. R. R., Toledo, O.

BARNES Co., W. F. & John, Rockford, Ill.

BEAMAN & Smith Co. (The), Providence, R. I.

BECKER Brainard Milling Machine Co., Hyde Park, Mass.

BLAKE & Johnson Co. (The), 125 E. Main St., Waterbury, Conn.

BOWN Machine Co., Ltd., Battle Creek, Mich.

BROWN & Sharpe Mfg. Co., Providence, R. I.

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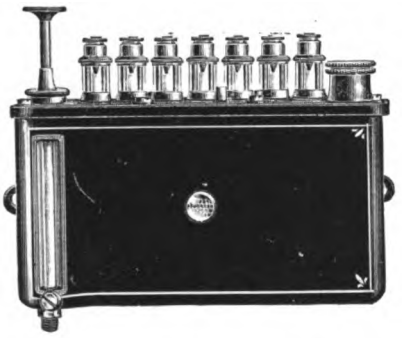
THE PEDERSEN

Gravity, Pressure, Gravity and Pressure Combined,
and

MECHANICAL OILERS

for Automobiles and Motor Boats

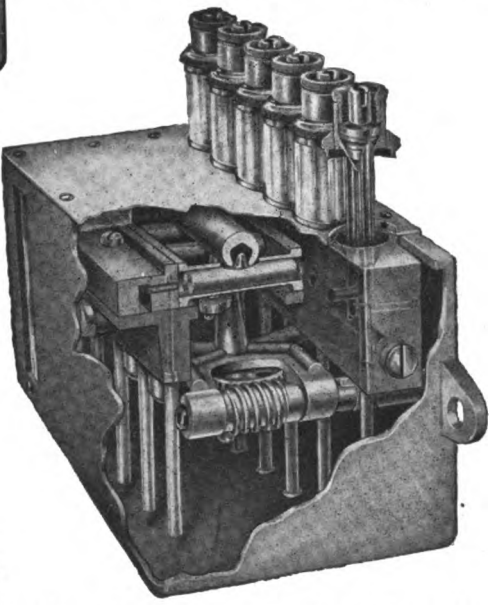


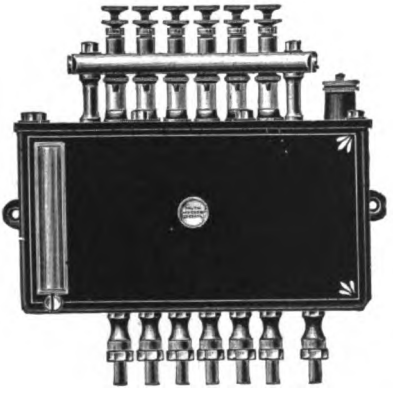
Have demonstrated their value on all grades of machines.

The highest class lubricator is as necessary to the life of a motor as a strong heart to a man.

This cut shows the mechanism of our Type L Oiler, in which there are no springs, check-valves or other uncertain devices; therefore it is free from the objectionable results incident with their use.

The working parts are reduced to the minimum number required to accomplish the results obtained.





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HILL, Clarke & Co., 156 Oliver St., Boston, Mass.

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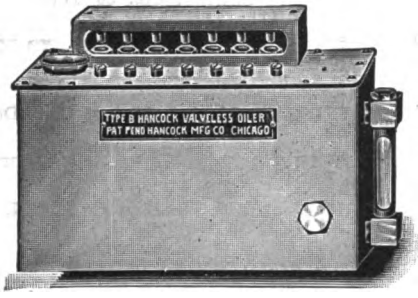

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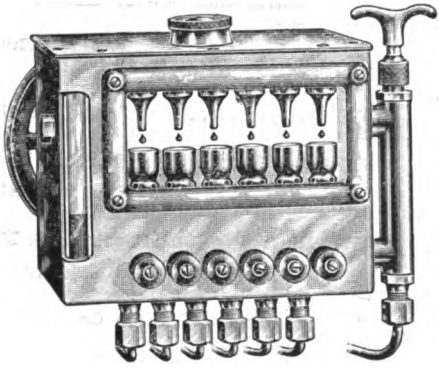

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CRANE & Whitman Co., 94-104 W. 7th St., Bayonne, N. J.

DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapolis, Ind.
(See page 61.)

FERRO Machine & Foundry Co. (The), 251 Wade Bldg., Cleveland, O.
(See page 215.)

GENERAL Manufacturing Co., Elkhart, Ind.

GILL & Sons Forge & Machine Works, P. H., 1 Lorraine St., Brooklyn, N. Y.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

Hartford Machine Screw Co., Hartford, Conn.
(See page 231.)

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

HEINDEL Mfg. Co., Hanover, Pa.

HILL Co., Geo. Q., 326 A St., Boston, Mass.

HOLT & Co., W. H., 95 Pine St., Providence, R. I.

HOMER Brass Works, Inc., 231 Ray St., Philadelphia, Pa.

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JONES, Frank S., 629 Filbert St., Phila., Pa.

JONES Motor Co., Geo. H., 6th St., Camden, N. J.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio.
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LEE Mfg. Co. (The), Port Huron, Mich.

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MANUFACTURERS' Foundry Co., Waterbury, Conn.

MASSNICH Mfg. Co., 1567 River St., Detroit, Mich.

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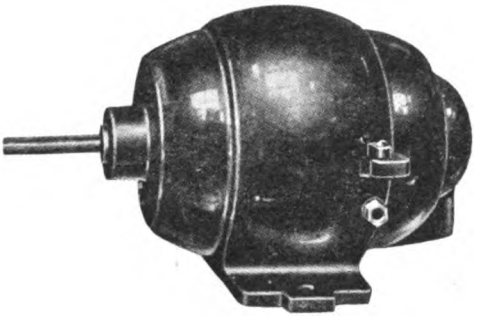

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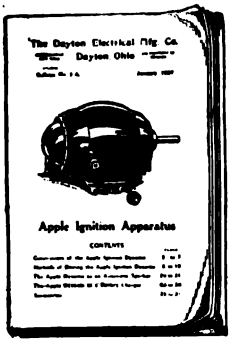

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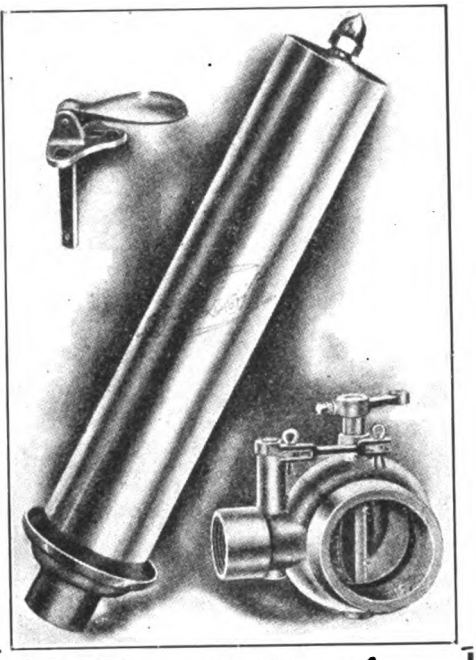

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(See page 181.)

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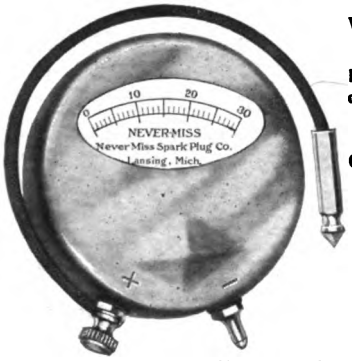

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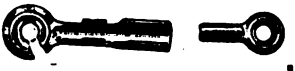

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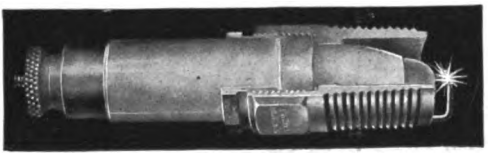

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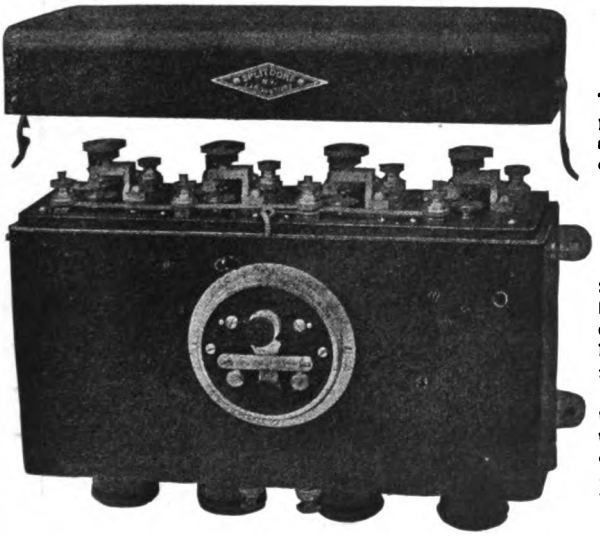

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ANSONIA Brass & Copper Co., Ansonia, Conn.

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BRIDGEPORT Brass Co., Bridgeport, Conn.

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ALLYNE Brass Fdry. Co., Cleveland, O., Detroit, Mich., and Buffalo, N. Y. (See page 55.)

AMERICAN Bronze Co., Berwyn, Pa.

ANSONIA Brass & Copper Co., Ansonia, Conn.

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CLARK, John W., Albany, N. Y.

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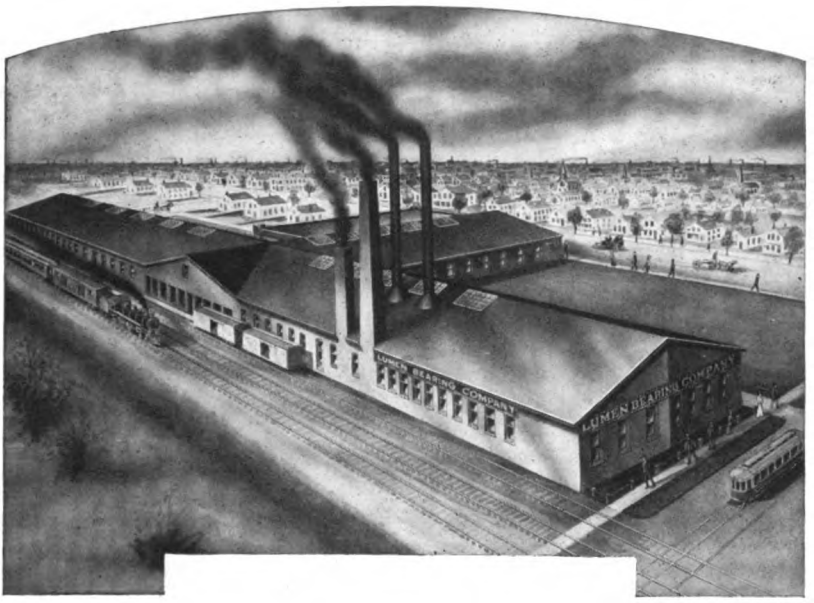

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MICA Insulator Co., 218 Water St., N. Y. City.

MICA Manufacturing Co., 307 W. Broadway, N. Y. City.

MUNSELL & Co., Eugene, 218 Water St., N. Y. City.

NORTH Carolina Mica Co., 95 Blackstone St., Boston, Mass.

SCHOONMAKER, A. O., 221 Fulton St., N. Y. City.

SILLS-Eddy Mica Co., Newark, N. J.

VANCE, D. T., Plumtree, N. C.

WATSON Bros., Foundry & Division Sts., So. Boston, Mass.

MIRRORS (Automobile)

ELECTRIC Signs & Signals Co., 177 1-2 East 87th St., N. Y. City.
(See page 29.)

MODEL MAKERS

(See Pattern Makers)

MONOGRAMS

ABBOTT, W. H., 1263 Broadway, N. Y. City.

CHILDS & Co., S. D., 200 S. Clark St., Chicago, Ill.

COLGAN Co., The J. W., Sudbury Bldg., Boston, Mass.

FIELD, Frank C., 605 N. St. Clair St., Toledo, O.

FINE, Horace E., Trenton, N. J.

HILLMAN Plating Co., 446 Tremont St., Boston, Mass.

MONOGRAM Crest & Sign Co., 125 E. 86th St., N. Y. City.

MURDOCK, Jr., Co., James, 116 Opera Pl., Cincinnati, O.

REES, F. H., Steele Memorial Bldg., Elmira, N. Y.

SALMAN & Co., John A., 17 Bromfield St., Boston, Mass.

STAFFORD Co., N., 67 Fulton St., N. Y. City.

STURGIS, E. A., 179 Summer St., Boston, Mass.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WALTER & Sons, N. C., 194 William St., N. Y. City.

MOTORS (Electric)

ADVANCE Mfg. Co. (The), Hamilton, O.

BROWNING Mfg. Co., Milwaukee, Wis.

BULLOCK Electric Mfg. Co., Cincinnati, O.

C. & C. Electric Co., 149 Broadway, N. Y. City.

EDDY Electric Mfg. Co. (The), Windsor, Conn.

ELECTRIC Vehicle Equipment Co., 20th St. and Montgomery Ave., Philadelphia, Pa.

ELWELL-Parker Electric Co., 1076 Hamilton St., Cleveland, O.

FORT WAYNE Electric Works, Fort Wayne, Ind.

GENERAL Electric Co., Schenectady, N. Y.

GILMORE Electric Co., 625 First St., Boston, Mass.

HOLTZER-Cabot Electric Co. (The), Brookline, Mass.

KENDRICK & Davis, Lebanon, N. H.

LAMB & Co., Kent & Lyons Sts., Grand Rapids, Mich.

LAMB Electric Co., 31 Canal St., Grand Rapids, Mich.

LINCOLN Electric Co., 1232 E. 3d St., N. E. Cleveland, O.

MILWAUKEE Electric Co., Milwaukee, Wis.

PARSELL & Weed, 129-131 W. 31st St., N. Y. City.

RICHARDSON Engineering Co., Hartford, Conn.
(See page 210.)

ROTH Bros. & Co., 27-29 S. Clinton St., Chicago, Ill.

SPRAGUE Electric Co., 527 W. 34th St., N. Y. City.

STERLING Electric Motor Co., Dayton, O.

STOREY Motor & Electric Co., 321 Sussex St., Harrison N. J.

WAGNER Electrical Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

WESTINGHOUSE Electric & Mfg. Co., Pittsburg, Pa.
(See page opposite.)

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Automobile Motors

¶ Our motors are of as nearly universal design as is possible, and can be applied to any orthodox construction of automobile.

¶ Our line of pleasure vehicle motors differs from that for business wagons, both being designed with special reference to their respective applications.

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The MANZEL
Force and Sight Feed Lubricator
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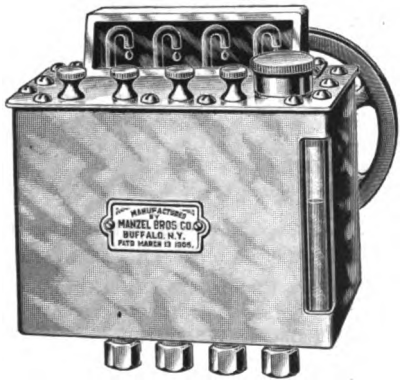

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Constant Sight Feed.

Made with any number of feeds —each feed being regulated independently.

Pulley or ratchet drive as desired.

Send for catalogue. ¶ Pumps on approval to manufacturers.

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MOTORS (Gasoline, Auto)

ALEXANDER, James, 68 W. Monroe St., Chicago, Ill.

AMERICAN Motor Co., Eau Claire, Wis.

AMERICAN Die & Tool Co., Reading, Pa.

ANDERSON Engine Co., Shelbyville, Ill.

ARMAC Motor Co., 472-478 Carroll Ave., Chicago, Ill.

B. L. M. Motor Car Co., 31-33 Delevan St., Brooklyn, N. Y.

BADECKER Gas Engine Co., Omaha, Neb.

BEAVER Mfg. Co., Milwaukee, Wis. (See page 129.)

BEILFUSS Motor Co. (The), Saginaw St. and M. C. Ry., Lansing, Mich.

BENDIX Co. (The), 4212 State St., Chicago, Ill. (See page 127.)

BENHER Motor Co., 120 Randolph St., Chicago, Ill.

BEVERLY Mfg. Co., Beverly, Mass.

BOWEN Motor Co., 419 Auburn Ave., Buffalo, N. Y.

BRENNAN Motor Co., Syracuse, N. Y.

BRIGGS & Wade, Lynn, Mass.

BROWNELL-Trebert Co., 408 St. Paul St., Rochester, N. Y.

BUDD & Ranney Mfg. Co. (The), 35-37 S. Scioto St., Columbus, O.

BUFFALO Engine Co., 12-20 Perry St., Buffalo, N. Y.

BURTT Mfg. Co., 128 No. Edward St., Kalamazoo, Mich.

CLARK Motor Co., E. C., Jackson, Mich.

CONTINENTAL Motor Mfg. Co. (The), Muskegon, Mich. (See page 123.)

CROSS Engine Co., M. O., 800-06 Bellevue Ave., Detroit, Mich.

CROUCH, Chas. P. & Co., 152 E. Lake St., Chicago, Ill.

CUSHMAN Motor Co., Lincoln, Neb.

DAVIS Mfg. Co., 267-273 6th St., Milwaukee, Wis.

DESCHLER, August, 18-20 East Water St., Chillicothe, O.

FAIRBANKS-Grant Mfg. Co., Ithaca, N. Y.

FAIRFIELD Motor Co. (The), 172 Cannon St., Bridgeport, Conn.

FEDERAL Automobile Co., 40th St. and Wentworth Ave., Chicago, Ill.

FOWLER Machine Co. (The), 1781 Middlesex St., Lowell, Mass.

FRISBIE Motor & Machine Works, Water St., Middletown, Conn.

GOSHEN Motor Works, 9th St. and Lincoln Ave., Goshen, Ind.

GRANT-Ferris Co., Troy, N. Y.

HANEY Gas Engine Co., Ligonier, Ind.

HARVARD Marine & Auto Co., 25 Eliot St., Cambridge, Mass.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (See page 5.)

HAYDEN Co., The N. L., 172-82 W. Locust St., Columbus, O.

HERSCHELL-Spillman Co., North Tonawanda, N. Y.

HOFFMAN Launch & Motor Works, W., 1253 North Halstead St., Chicago, Ill.

HOMAN, J. & E., 380 West Broadway, N. Y. City.

HOULE Motor Works, A. J., Holyoke, Mass

HUBBARD Motor Co., Middletown, Conn.

ILLINOIS Auto & Parts Co., Globe & Main Sts., Peoria, Ill.

ILLINOIS Motor Works, 719-23 Sheffield Ave., Chicago, Ill.

JENCICK Motor Mfg. Co., Port Chester, N. Y.

JONES Motor Co., Geo. H., 6th St., Camden, N. J.

KIRKHAM Motor Mfg. Co. (The), Bath, N. Y.

LAUTH & CO., J., 528 Elston Ave., Chicago, Ill.

MICHIGAN Automobile Co., Ltd., Kalamazoo, Mich. (See page 123.)

MILWAUKEE Auto Engine and Supply Co., 706-708 Winnebago St., Milwaukee, Wis.

MILWAUKEE Motor Co., Milwaukee, Wis.

MODEL Automobile Co., Peru, Ind.

MOLINE Pump Co., Moline, Ill.

MURRAY, W. B., 1253 Milwaukee Ave., Chicago, Ill.

NEER Air Cooled Engine Co. (The), Plain City, O.

NEWPORT Engineering Works, 359-67 Thames St., Newport, R. I.

NORTH Chicago Machine Co., North Chicago, Ill.

NORTHWAY Motor & Mfg. Co., Maybury and Grand Aves., Detroit, Mich.

NUTTING Machine Co., Dayton, O.

O. K. Gas Engine Works, Winchester, O.

OSWALD Motor Co. (The), Goshen, Ind.

OTTO Gas Engine Works (The), 33d & Walnut Sts., Philadelphia, Pa.

PHILLIPS Motor Works, 405 Tacoma Bldg., Chicago, Ill.

PIERCE Engine Co., Racine, Wis.

PITTSBURG Machine Co. (The), New Brighton, Pa.

PURITAN Machine Co., 12-16 Gratiot Ave., Detroit, Mich.

PUTNAM, R. H., 57 Lebanon St., Springfield, Mass.

REEVES Pulley Co., Columbus, Ind.

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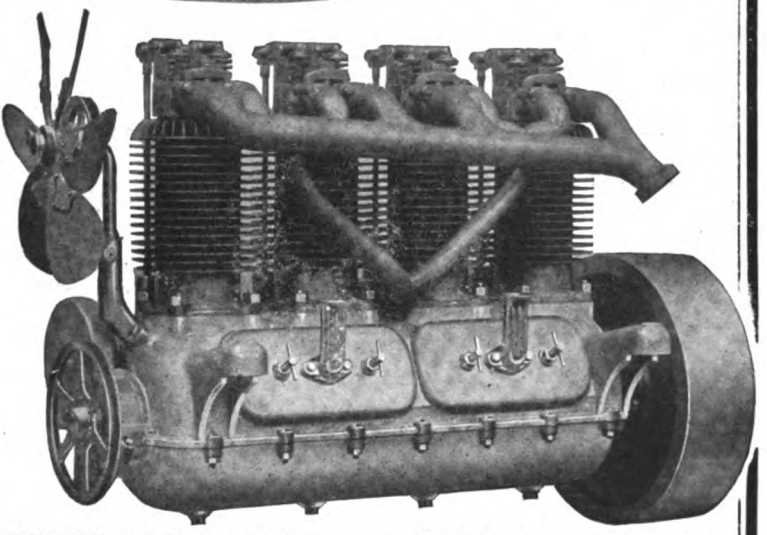
works 365 days a year



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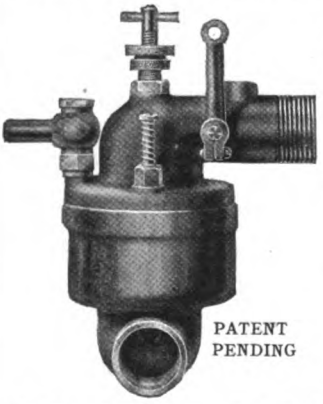

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MANUFACTURERS, it isn't sufficient to merely take our word for it, you must satisfy yourselves by a test—and be prepared to meet the demand, for air-cooled engines have come to stay—and you had better "get next" to the best—the "CARRICO."

Full details on application.

"Universal Carbureter"
"Positively Guaranteed"

To Increase the power of the engine,
" Increase the speed of the engine,
" Deliver a perfectly uniform mixture at all engine [speeds,
" Economize in gasoline consumption,
" Start engine with very little cranking,
Or purchase price refunded after a trial of ten days.

SPEED CHANGING PULLEY CO.
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MOTORS (Gasoline, Auto) (Continued)

ROBERTS, R. M., 140 Indiana Ave., Anderson, Ind.

ROSS, H. S., 5607 So. Halsted St., Chicago, Ill.

SANDUSKY Foundry & Machine Co., Sandusky, O.

SCHLOSSER Mfg. Co., 151 E. 126th St., New York City.

SINTZ, Guy L., Fulton and Front Sts., Grand Rapids, Mich.

SPEED Changing Pulley Co., Indianapolis, Ind.
(See page 121.)

STERLING Engine Co., 110-119 Grant St., Buffalo, N. Y.

STREIT Machine Co., The A., 1108-10 Harrison Ave., Cincinnati, O.

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

SWAIN Engine Co., 2239 State St., Chicago, Ill.

THEIM Mfg. Co., 38th St. & University Ave., N. E., Minneapolis, Minn.

TREBERT Gas Engine Co., 163-165 Main St., W., Rochester, N. Y.

TRENTON Malleable Iron Co., New York Ave., Trenton, N. J.

TRUSCOTT Boat Mfg. Co., St. Joseph, Mich.

UNITED Mfg. Co., 175 Woodbridge St., Detroit, Mich.

VAN AUKEN-Clevauce Co., Yonkers, N. Y.

WARREN Mfg. Co., Warren, Mass.

WAUKESHA Motor Co., 119 North St., Waukesha, Wis.

WESTERFIELD Motor Co. (The), 1531 S. Main St., Anderson, Ind.

WESTERN Motor Co., Logansport, Ind.

WILLET Engine & Carbureter Co., 764 Ellicott Sq., Buffalo, N. Y.

WRIGHT Motor Co., 48 S. Division St., Buffalo, N. Y.

XARDELL Co., C. A., Utica, N. Y.

YOCOM Co., A. H., Reading, Pa.

MOTORS (Gasoline, Marine)

AERO & Marine Motor Co. (The), 60 Pemberton Sq., Boston, Mass.

ALEXANDER, James, 68 W. Monroe St., Chicago, Ill.

AMERICAN Motor Co., Eau Claire, Wis.

ANDERSON Engine Co., Shelbyville, Ill.

ATLANTIC Co. (The), Amesbury, Mass.

AURORA Motor Works, North Aurora, Ill.

AUTOMATIC Machine Co. (The), 145-53 Stratford Ave., Bridgeport, Conn.

AYRES Gasoline Engine & Auto Works, Saginaw, Mich.

BADECKER Gas Engine Co., Omaha, Neb.

BADGER Motor Co., Milwaukee, Wis.

BARBER Bros., 101 Grape St., Syracuse, N. Y.

BARKER Engine Co., South Norwalk, Conn.

BELCHER Motor Co., Fall River, Mass.

BEVERLY Mfg. Co., Beverly, Mass.

BRENNAN Motor Co., Syracuse, N. Y.

BRIDGEPORT Motor Co., Inc., Bridgeport, Conn.

BRIGGS & Wade, Lynn, Mass.

BRILL Engine Works, Appleton, Wis.

BROOKS Boat Mfg. Co., Saginaw, Mich.

BROWN-Cochran Co. (The), Lorain, O.

BROWN-Talbot Co., Salem, Mass.

BROWNELL-Trebert Co., 408 St. Paul St., Rochester, N. Y.

BRUNO-Knapp Co., Saginaw, W. S., Mich.

BUDD & Ranney Mfg. Co. (The), 35-37 S. Scioto St., Columbus, O.

BUFFALO Gasoline Motor Co., 1286 Niagara St., Buffalo, N. Y.

CAILLE Bros. Co. (The), 2d Ave. and Amsterdam St., Detroit, Mich.

CAMDEN-Anchor-Rockland Machine Co., Rockland, Me.

CAMPBELL Motor Co., Wayzata, Minn.

CARLSON, Chas. A., 1016 Bedford Ave., Brooklyn, N. Y.

CHASE Motor Co., 201 Pitman St., Providence, R. I.

CHICAGO Caloric Engine Co., Chicago, Ill.

CLEMICK-Hirsch Co., 594 National Ave., Milwaukee, Wis.

CLIFTON Motor Works, 265 E. Clifton Ave., Cincinnati, O.

COLEMAN & Sons, Walter, 300 S. Water St., Providence, R. I.

COOLEY Mfg. Co., Waterbury, Vt.

CONTINENTAL Motor Mfg. Co., Muskegon, Mich.
(See page opposite.)

CRAIG & Scott, 556 W. 34th St., N. Y. City.

CROSS Engine Co., M. O., 800-06 Bellevue Ave., Detroit, Mich.

CROUCH & Co., Chas. P., 152 E. Lake St., Chicago, Ill.

CUSHMAN Motor Co., Lincoln, Neb.

DAVIS Mfg. Co., 267-273 6th St., Milwaukee, Wis.

DE MOOY Bros., 765-767 Willson Ave., Cleveland, O.

DETROIT Auto Marine Co., 82 Congress St., E., Detroit, Mich.

DINGFELDER Motor Co., Detroit, Mich.

DOMAN Co., H. C., Oshkosh, Wis.

DUCRO Mfg. Co., 1378 Niagara St., Buffalo, N. Y.

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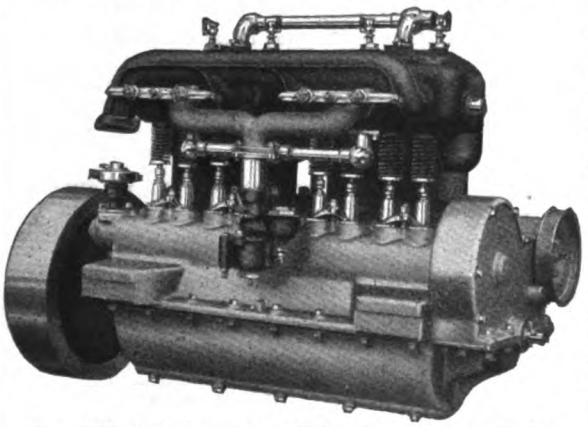

Type "G" 4-cylinder motor; cylinders 4¾ in. bore, 5 in. stroke.

CONTINENTAL MOTORS COMMAND CONSIDERATION

when preparing specifications for high-grade cars. Cut shows our standard four-cylinder motor, which we can furnish with cylinders 5″ x 5″ if desired. Cylinders are offset reducing cylinder friction and all valves are operated by one cam shaft, reducing wear and gear noise. We can also supply this motor with self-contained oiling system in bottom of case, making the lubrication independent of separate oiling device and absolutely "fool proof." Motors are furnished ready for mounting any standard magneto.

Our new plant is devoted entirely to the manufacture of motors and we are specialists in this line. **Our design is of the most approved type and combines economy, durability and efficiency.** These motors are built with special tools and jigs, making all parts absolutely interchangeable, a point to be considered when selecting motors. We are prepared to contract for large quantities and guarantee deliveries. Write for catalogue and printed matter.

CONTINENTAL MOTOR MFG. CO., Muskegon, Mich.
K. FRANKLIN PETERSON, Factory Representative, 166 Lake St., Chicago, Ill.

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MOTORS (Gasoline, Marine)
(Continued)

DULUTH Gas Engine Works, Minnesota Ave., and Vine St., Duluth, Minn.

DUNN, Walter E., Ogdensburg, N. Y.

EASTERNHOUSE Engine Co., Taunton, Mass.

ECHO Company, Young & Delaware Sts., Tonawanda, N. Y.

ECLIPSE Engine Works, Mancelona, Mich.

ERD Motor Co., Saginaw, Mich.

ESSEX Engine Co. (The), 416 Union St., Lynn, Mass.

FAIRBANKS-Grant Mfg. Co., Ithaca, N. Y.

FAIRBANKS, Morse & Co., Franklin & Monroe Sts., Chicago, Ill.

FAIRFIELD Motor Co. (The), 172 Cannon St., Bridgeport, Conn.

FAY & Bowen Engine Co., 92 Lake St., Geneva, N. Y.

FERRO Machine & Foundry Co. (The), 251 Wade Bldg., Cleveland, O. (See page 215.)

FOWLER Machine Co. (The), 1781 Middlesex St., Lowell, Mass.

FOX Reversible Gasoline Engine Co. (The), Front & Washington Sts., Newport, Ky.

FREELAND Sons Co., B. F., Sturgis, Mich.

FRISBIE Motor & Machine Works, Water St., Middletown, Conn.

GAS Engine & Power Co. & Chas. L. Seabury Co., Morris Heights, N. Y. City.

GOSHEN Motor Works, 9th St. & Lincoln Ave., Goshen, Ind.

GRAND Rapids Gas Engine & Yacht Co., Grand Rapids, Mich.

GRAY & Prior Machine Co. (The), Hartford, Conn.

GRAY Motor Co., Lieb & Larned Sts., Detroit, Mich.

GREEN Bay Machine Co., Green Bay, Wis.

HAASE Motor Wks., 1019 Lloyd St., Milwaukee, Wis.

HANEY Gas Engine Co., Ligonier, Ind.

HARVARD Marine & Auto Co., 25 Eliot St., Cambridge, Mass.

HASBROUCK Motor Works, Inc., 155 Water St., New London, Conn.

HEINEL Co., H. A., Wilmington, Del.

HERSCHELL-Spillman Co., North Tonawanda, N. Y.

HILDRETH Mfg. Co. (The), 703 Sheridan St., Lansing, Mich.

HILL, R. S., 78 E. Fort St., Detroit, Mich.

HOFFMAN Launch & Motor Works, W., 1253 N. Halsted St., Chicago, Ill.

HOLLIDAY Mfg. & Engineering Co., 160 Bunker St., Chicago, Ill.

HOLMES Motor Co., West Mystic, Conn.

HOULE Motor Works, A. J., Holyoke, Mass.

HOWE Scale Co., 509 Market St., Philadelphia, Pa.

HUBBARD Motor Co., Middletown, Conn.

HURD & Haggin, 316 Hudson St., N. Y. City.

JACKSON Machine Works, Traverse City, Mich.

JAGER Gas Engine Co., 33 Canal St., Providence, R. I.

JENCICK Motor Mfg. Co., Port Chester, N. Y.

JOHNSON Motor Co. (The), Chester, Pa.

KAHLENBERG Bros., Two Rivers, Wis.

KEIDEL & Co., Henry, Baltimore, Md.

KIRKHAM Motor Mfg. Co. (The), Bath, N. Y.

KOWALSKY Engine Co. (The), J., Verona, Pa.

LACKAWANNA Mfg. Co. (The), Newburgh, N. Y.

LAMB Boat & Engine Co., Clinton, Ia.

LATHROP, J. W., Mystic, Conn.

LEIGHTON, H. J., 901 Fayette St., Syracuse, N. Y.

LOCKWOOD-Ash Motor Co., Jackson, Mich.

McNAIL Brainard Engine Co., 390 Webster Ave., Long Island City, N. Y.

MASON Engine Works, Wm., Mt. Carmel, Ill.

MECHANICAL Electrical Construction Co., Philadelphia, Pa.

MIANUS Motor Works, Mianus, Conn.

MILWAUKEE Auto Engine & Supply Co., 706-08 Winnebago St., Milwaukee, Wis.

MILWAUKEE Motor Co., 615 Clybourn Ave., Wilwaukee, Wis.

MORTON Marine Motor Co., Third and Milton Sts., Camden, N. J.

MOTOR Car Power Equipment Co., Rear 577 Grove St., Milwaukee, Wis.

MURRAY & Tregurtha Co., 340 W. First St., So. Boston, Mass.

NEW London Motor Co., New London, Conn.

NOANK Motor Works, Noank, Conn.

NORTH Chicago Machine Co., North Chicago, Ill.

NOTTING & Son, Prospect, O.

NOYE Mfg. Co., Buffalo, N. Y.

OSWALD Motor Co. (The), Goshen, Ind.

OTTO Gas Engine Works (The), 33d and Walnut Sts., Philadelphia, Pa.

PAGE Engineering Co., Baltimore, Md.

PALMER Bros., Coscob, Conn.

PALMER-Moore Co., 317 E. Washington St., Syracuse, N. Y.

PARKER Co., J. J., 506 Erie St., Fulton, N. Y.

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MARINE MOTOR
STATIONARY ENGINE
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MOTORS (Gasoline, Marine) (Continued)

PENINSULAR Motor Co., Grand Rapids, Mich.

PENNSYLVANIA Iron Works Co., 50th and Lancaster Ave., Philadelphia, Pa.

PHILLIPS Motor Works, 405 Tacoma Bldg., Chicago, Ill.

PIERCE Engine Co., Racine, Wis.

PIGGINS Bros., Racine, Wis.

POTTER Mfg. Co., Water St., New Brunswick, N. J.

PROGRESSIVE Mfg. Co., 41 Norwood St., Torrington, Conn.

PUTNAM, R. H., 57 Lebanon St., Springfield, Mass.

RACINE Boat Mfg. Co., Muskegon, Mich.

RAMSEY Mfg. Co., 472 Bullitt Bldg., Philadelphia, Pa.

RATHBUN-Lacy Co., Toledo, O.

RED Wing Boat Mfg. Co., Red Wing, Minn.

REGAL Gasoline Engine Co., Coldwater, Mich.

REX Motor Co., 69 Woodward Ave., Detroit, Mich.

RICE, Jr., & Co., John V., Bordentown, N. J.

ROCHESTER Gas Engine Co., 705 Driving Park Ave., Rochester, N. Y.

ROSS, H. S., 5607 So. Halsted St., Chicago, Ill.

ROYAL Equipment Co., 165 Housatonic St., Bridgeport, Conn.

SAGINAW Yacht & Motor Co., Saginaw, Mich.

SAFFORD Mfg. Co., W. F., Westerly, R. I.

SAINT Clair Motor Co., 131 Beaubien St., Detroit, Mich.

SCHLOSSER Mfg. Co., 151 E. 126th St., New York City.

SEITZ Co., F. A., 141 Frelinghuysen Ave., Newark, N. J.

SINTZ-Wallin Co. (The), 285 S. Front St., Grand Rapids, Mich.

SMALLEY Motor Co., Ltd., Bay City, Mich.

SPARKS Machine Co., C. F., Alton, Ill.

SPAULDING Engine Co., St. Joseph, Mich.

STAMFORD Motor Co. (The), Stamford, Conn.

STANDARD Motor Construction Co., 172 Whiton St., Jersey City, N. J.

STERLING Engine Co., 119-121 Grant St., Buffalo, N. Y.

STERLING Engine Co., 29 S. Clinton St., Chicago, Ill.

STERLING Engine Co., Fall River, Mass.

STORK Motor Co., Saginaw, Mich.

STOVER Motor Car Co., Freeport, Ill.

STREIT Machine Co. (The), A., 1108-10 Harrison Ave., Cincinnati, O.

TEMPLE Pump Co. (The), 15th St. and 15th Pl., Chicago, Ill.

TERMAAT & Monahan Co., Oshkosh, Wis.

THOUSAND Island Boat & Engine Co., Morristown, N. Y.

TOCQUET Motor Co. (The), 4th Ave. and 24th St., N. Y. City.

TOLEDO Motor Boat & Power Co., Ft. of Washington St., Toledo, O.

TORREY Roller Bushing Works, Bath, Me.

TREBERT Gas Engine Co., 163-165 Main St., W., Rochester, N. Y.

TRUSCOTT Boat Mfg. Co., St. Joseph, Mich.

TUTTLE Co., D. M., Canastota, N. Y.

UNITED Mfg. Co., 175 Woodbridge St., Detroit, Mich.

VIM Motor Co. (The), Sandusky, O.

VIRTUE & Pound Mfg. Co., Owatanna, Minn.

WATERMAN Marine Motor Co., Detroit, Mich.

WATKINS, Frank M., Co. (The), 525-531 Baymiller St., Cincinnati, O.

WATERTOWN Motor Co., 40 Moulton St., Watertown, N. Y.

WATT Engine Co., Port Huron, Mich.

WESTERN Auto Supply Co., 285 Virginia St., Milwaukee, Wis.

WESTERN Launch & Engine Works, Michigan City, Ind.

WESTERN Motor Co., Logansport, Ind.

WILLET Engine & Carbureter Co., 764 Ellicott Sq., Buffalo, N. Y.

WOLVERINE Motor Works, Foot of Union Ave., Bridgeport, Conn.

WRIGHT Motor Co., 48 S. Division St., Buffalo, N. Y.

MOTORS (Kerosene)

AMERICAN Diesel Oil Engine Co., 11 Broadway, New York City.

ACME Oil Engine Co., Union Ave., near R. R., Bridgeport, Conn.

BUFFALO Gasoline Motor Co., 1286 Niagara St., Buffalo, N. Y.

FAY & Bowen Engine Co., 92 Lake St., Geneva, N. Y.

GRAND Rapids Gas Engine & Yacht Co., Grand Rapids, Mich.

INTERNATIONAL Power Vehicle Co., 216 Pacific St., Stamford, Conn.

MIETZ, A., 138 Mott St., N. Y. City.

NEW YORK Kerosene Oil Engine Co., 31 Burling Slip, New York, N. Y.

WOLVERINE Motor Works, Foot of Union Ave., Bridgeport, Conn.

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MANUFACTURERS OF AUTOMOBILE PARTS

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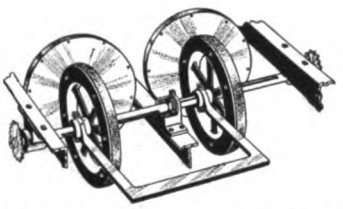

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MOUNTINGS

(See Trimmings, Metal)

MUD GUARDS

(See Dashes and Fenders)

MUFFLERS

AUTO & Power Appliance Co., The Arcade, Cleveland, O.
(See page 255.)

A-Z Co. (The), 527 West 56th St., N. Y. City.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J.
(See page 145.)

BYRNE, Kingston & Co., Kokomo, Ind.

CHAMPION Mfg. Co., 9-15 Alling St., Newark, N. J.

FEDERAL Automobile Co., 40th St. and Wentworth Ave., Chicago, Ill.

GRAY-Hawley Mfg. Co., 605-609 Fort St. W., Detroit, Mich.

HAMMAR Mfg. Co., H., 170 E. Madison St., Chicago, Ill.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

HAYES Mfg. Co., 360-70 Maybury Ave., Detroit, Mich.
(See page 73.)

HAYNEY, Geo. F., Lynn, Mass.

KELLS Mfg. Co., W. J., 60-62 Van Winkle Ave., Jersey City, N. J.

KINSEY Mfg. Co., 1126 E. 3rd St., Dayton, O.

KNOBLOCK-Heideman Mfg. Co., South Bend, Ind.

LOOMIS Autocar Co., Westfield, Mass.

KONIGSLOW Mfg. Co., Otto, Cleveland, O.
(See page 49.)

MILWAUKEE Motor Co., 615 Clybourn Ave., Milwaukee, Wis.

MOTOR & Mfg. Works Co., Geneva, N. Y.
(See page opposite.)

MOTSINGER Device Mfg. Co., 36 Main St., Pendleton, Ind.

OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

POWELL Muffler & Timer Co., 42 La Fayette St., Utica, N. Y.
(See page 251.)

ROSS, H. S., 5607 So. Halsted St., Chicago, Ill.

SMITH & Co., D. B., Utica, N. Y.

SNOW, B. W., 132 Bissell St., Syracuse, N. Y.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WEEBER Mfg. Works, C. F., 170-172 Central Ave., Albany, N. Y.

WESTERFIELD Motor Co., Anderson, Ind.

WESTERN Motor Co., Logansport, Ind.

NAME PLATES

ABBOTT, W. H., 1263 Broadway, N. Y. City.

ALUMINUM Mfg. Co., Two Rivers, Wis.

ATWOOD Mfg. Co., Amesbury, Mass.

BALTIMORE Enamel & Novelty Co., Ft. of Allen St., Baltimore, Md.

BECKER, August, 247 Atlantic Ave., Boston, Mass.

BLACKINGTON & Co., V. H., Attleboro Falls, Mass.

CHANDLER Co. (The), 31 Taylor St., Springfield, Mass.

CHICAGO Art Metal Works, 67 Lake St., Chicago, Ill.

CHILDS, S. D., & Co., 200 So. Clark St., Chicago, Ill.

CROWE Metal Mfg. Co., 71 W. Jackson Blvd., Chicago, Ill.

DETROIT Rubber Stamp Co., 99 Griswold St., Detroit, Mich.

EASTWOOD Wire Mfg. Co., Belleville, N. J.

ENGLISH & Mersick Co. (The), 70-74 Crown St., New Haven, Conn.

GREACON & Co., Walter, 12 Mechanic St., Newark, N. J.

IMPERIAL Brass Mfg. Co., 247 So. Jefferson St., Chicago, Ill.

MEYERCORD Co. (The), Chamber of Commerce, Chicago, Ill.

MONOGRAM Crest & Sign Co., 1937 Broadway, N. Y. City.

MORSE & Son, C. H., 13 So. Water St., Rochester, N. Y.

MURDOCK-Shaw Co., 125 Federal St., Boston, Mass.

MURDOCK, Jr., Co., Jas., 116 Opera Place, Cincinnati, O.

NEW YORK Stencil Works, 100 Nassau St., New York, N. Y.

QUINT & Sons, S. H., 15 So. 4th St., Philadelphia, Pa.

REES, F. H., Steele Memorial Bldg., Elmira, N. Y.

ROBBINS Mfg. Co., John, 58 Kneeland St., Boston, Mass.

ROGERS, C. E., 34 Beach St., Boston, Mass.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich.
(See page 139.)

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EFFICIENT—DURABLE—COMPACT

PERFORMANCE—not words—sells Beaver Motors. Perfect running balance, positive lubricating system, ample bearings, interchangeability of parts and uniform performance.

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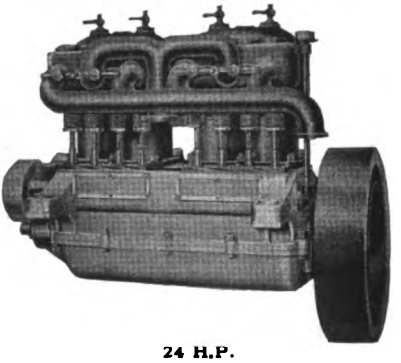

24 H.P.

EJECTOR MUFFLER

Fig. 1

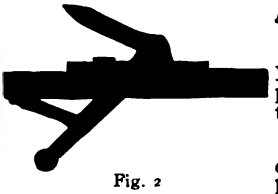

Fig. 2

THE EJECTOR, MUFFLER, CUT-OUT VALVE AND FOOT PEDAL

Fig. 1 — Cutout Valve
Fig. 2 — Foot Pedal
Fig. 3 — The Muffler

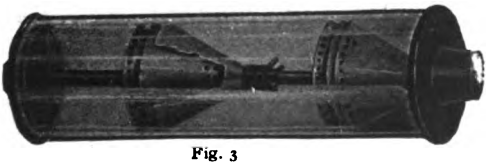

Fig. 3

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Designed and built on exclusive lines, it absolutely silences the explosions without taking power from the Motor but ACTUALLY INCREASING IT.

This may seem an out-of-the-ordinary combination, it is — because it is done by an *out-of-the-ordinary muffler*, but send your name and address *and we will prove it.*

Special inducements to manufacturers and live dealers to handle our muffler. Write to-day.

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SMITH Mfg. Co., The R. H., Springfield, Mass.
(See page 163.)

STAFFORD Co., N., 67 Fulton St., New York City.

TORREY Roller Bushing Works, Bath, Me.

UNITED STATES Bronze Co. (The), 1831 Columbus Road, Cleveland, O.

WALTER & Sons, N. C., 194 William St., N. Y. City.

NIPPLES

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 231.)

JAMESVILLE Mfg. Co., Jamesville, N. Y.

JUDD & Leland Mfg. Co., Clifton Springs. N. Y.

PARK City Brass Co., Springfield, Mass.

PARKER, E. N., Springfield, Mass.

SHRIMPTON Mfg. Co., Church St., N. Y. City.

STANDARD Co. (The), Torrington, Conn.
(See page 157.)

STEVENS & Co., 99 Chambers St., New York, N. Y.

TILEY-Pratt Co. (The), Essex, Conn.

TOLEDO Metal Wheel Co:, Toledo, O.

YOUSE, E. S., 46 N. 5th St., Reading, Pa.

NUTS AND WASHERS (Lock)

ALLISON Mfg. Co., Philadelphia, Pa.

COLUMBIA Nut & Bolt Co., Bridgeport, Conn.

EUREKA Nut Lock Co., 32nd & Smallman Sts., Pittsburg, Pa.

FLUKE, F. S., 6036 Woodlawn Ave., Chicago, Ill.

GRIP Nut Co., 15 Lake St., Chicago, Ill.

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 231.)

LOCK Nut "It" Concern, 515 E. 63rd St., Chicago, Ill.

NATIONAL Elastic Nut Co., Milwaukee, Wis.

NATIONAL Lock Washer Co., 65-89 Johnson St., Newark, N. J.
(See page 221.)

PENINSULAR Milled Screw Co., 751 Bellevue Ave., Detroit, Mich.

POSITIVE Lock Washer Co. (The), Newark, N. J.
(See page 195.)

SMITH Improved Lock Nut Co., Rockford. Ill.

SPIRAL Nut Lock Co., 432 E. 71st St., New York, N. Y.

WATERBURY Mfg. Co., Waterbury, Conn.

ODOMETERS

(See Speedometers)

OILS

ACME Oil & Supply Co., 345 S. Canal St., Chicago, Ill.

ALEXANDER & Co., H. T., 17 State St., N. Y. City

AMERICAN Oil Co., 170-178 S. Water St., Jackson, Mich.

ANNIS Oil Co., N. L., 139 Potomac St., Buffalo, N. Y.

AUTO Oil Co., Jackson, Mich.

BAUM'S Castorine Co., Rome, N. Y.

BESLY & Co., C. H., 15-21 So. Clinton St., Chicago, Ill.

BORNE-Scrymser Co., Claremont, N. J.

CHAMPION Oil Co., 39th St. and Lowe Ave., Chicago, Ill.

CHESTERTON & Co., A. W., 64 India St., Boston, Mass.

CHILDS Co., The G. B., 499 Greenwich St., N. Y. City.

COLUMBIA Lubricants Co. of New York, 78 Broad St., N. Y. City.
(See page opposite.)

CURRY Oil & Supply Co., Boston, Mass.

DEARBORN Drug & Chemical Works, Chicago, Ill.

DIXON Crucible Co., Jos., Wayne and Monmouth Sts., Jersey City, N. J.

DRAPER Co., Walter H., 120 South Railroad Ave., Mount Vernon, N. Y.

EAGLE Oil & Supply Co., 104 Broad St., Boston, Mass.

ECONOMY Oil & Compound Co., 442 Clark St., Chicago, Ill.

EMERY Mfg. Co., 41 Main St., Bradford, Pa.

FISKE Bros. Refining Co., 13-15 Old Slip, N. Y. City.
(See page 91.)

GALLAWAY, G. W., 322 Pearl St., New York.

GREENSLADE Oil Co., 23rd St. & M. C. Ry., Detroit, Mich.

HARRINGTON Lubricant Co., 1691 Broadway, New York.

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OILS

(Continued)

HARRIS Oil Co., A. W., 330 Water St., Providence, R. I. (See cover.)

HAVOLINE Oil Co., 78 Broad St., N. Y.

HAWS, George A., 74 Pine St., N. Y. City. (See page opposite.)

HOFFMAN Lubricating Oil Co., Binghamton, N. Y.

HOSMER Co., G. A., 376 Ellicott St., Buffalo, N. Y.

KANTER Co., R. J., 647 Water St., N. Y. City.

KELLOGG & Co., E. H., 243-244 South St., N. Y. City.

KELLOM & Co., Chas. F., 128 Arch St., Philadelphia, Pa.

KEYSTONE Supply Co., Columbus, O. (See page 137.)

MACLEAN-Brandom Oil & Supply Co., 65 Long Wharf, Boston, Mass.

MAGIE Bros., 9-11 No. Canal St., Chicago, Ill.

MARION Mfg. Co., Franklin, Pa.

MILLER'S Sons, Wm. P., 73-79 Third St., Long Island City, N. Y. (See page 223.)

MODOC Co. (The), Foot of Market St., Chester, Pa.

MONARCH Mfg. Co., Toledo, O.

MOUND CITY Oil & Supply Co., 203-205 North Levee, St. Louis, Mo.

MUSLINER & Co., Jos., 156 Maiden Lane, N. Y. City.

NATIONAL Cement & Rubber Mfg. Co., 3053-59 Monroe St., Toledo, O.

NEW YORK & New Jersey Lubricant Co., 15 Church St., N. Y. City.

NORTHROP Lubricating Oil Co., 308 N. Commercial St., St. Louis, Mo.

NYE, Wm. F., New Bedford, Mass.

OIL City Oil & Grease Co., Spring St., Oil City, Pa.

O-U-T-O Co. (The), 19 Camfield St., Newark, N. J.

PARAGON Refining Co. (The), Front St., Toledo, O.

PENN Oil & Supply Co., Chicago, Ill.

PENN Petroleum Co., 117 North 2d St., Philadelphia, Pa.

PHILADELPHIA Grease Mfg. Co., The Bourse, Philadelphia, Pa.

PIGOT, Sayre & Co., 135 William St., N. Y. City.

PULVER & Sons, Peter, N. Y. City.

RELIANCE Oil & Grease Co., 12 S. Water St., Cleveland, O.

RICHARDSON Lubricating Co., Quincy, Ill.

ROBINSON & Son Co., Wm. C., 336-42 North St., Baltimore, Md. (See cover.)

ROYAL Lubricating Oil Co., 116 Broad St., N. Y. City.

ROYAL Oil Co., 2 Platt St., N. Y. City.

SHEPPARD, W. S., 22 Lawrence St., Newark, N. J. (See page 147.)

SPEAR'S Sons Co., The Alden, 369 Atlantic Ave., Boston, Mass.

STANDARD Oil Co., 26 Broadway, N. Y. City.

STAR Lubricating Co., 140 W. 32nd St., N. Y. City.

STERLING Oil Co., Emlenton, Pa.

SULLIVAN Oil Co., 48 Wells St., Chicago, Ill.

SWAN & Finch Co., 151 Maiden Lane, New York City.

SWEET, Charles F., 61 Market St., Hartford, Conn.

UNDERHAY Oil Co., 275 Franklin St., Boston, Mass.

VACUUM Oil Co., Rochester, N. Y.

VALVOLINE Oil Co., Eastchester Station, N. Y. City.

VISCOSITY Oil Co., 21 River St., Chicago, Ill.

WADHAMS Oil Co., Milwaukee, Wis.

WHITE & Bagley Co. (The), 100 Foster St., Worcester, Mass.

WINN Co., F. R., 147 Maiden Lane, N. Y. City.

YOUNG, Orlando W., 180 Freylinghuysen Ave., Newark, N. J. (See page 141.)

OILS (Semi-Solid)

AMERICAN Oil Co., 170-78 S. Water St., Jackson, Mich.

AUTO Oil Co., Jackson, Mich.

BORNE, Scrymser Co., Claremont, N. J.

COLUMBIA Lubricants Co. of New York, 78 Broad St., N. Y. City. (See page 131.)

HARRIS Oil Co., A. W., 330 South Water Water St., Providence, R. I. (See cover.)

HAWS, Geo. A., 74 Pine St., N. Y. City. (See page opposite.)

KELLOM & Co., Chas. F., 128 Arch St., Philadelphia, Pa.

MILLER'S Sons, Wm. P., 73-79 Third St., Long Island City, N. Y. (See page 223.)

MUSLINER & Co., Jos., 156 Maiden Lane, N. Y. City.

NEW YORK & New Jersey Lubricant Co., 14 Church St., New York City.

PARAGON Refining Co. (The), Front St., Toledo, Ohio.

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A heavy semi-oil, between the consistency of grease and oil, for Differentials, Planetary and Sliding Gears. **IT HAS NO EQUAL.** We also make it in a heavy free-flowing oil, for those who require that kind. Put up in barrels, half-barrels 5 and 1-gallon cans with a large opening.

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(See cover.)

SHEPPARD, W. S., 22 Lawrence St., Newark, N. J.
(See page 147.)

STANDARD Oil Co., 26 Broadway, N. Y. City.

OIL CANS

AKRON Mfg. Co., 927 High St., Akron, O.

ALUMINUM Mfg. Co., Two Rivers., Wis.

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

BLOOMER, R. E., Keithsburg, Ill.

BROWN Oil Can Co., Dawson St., Toledo, O.

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

GEM Mfg. Co., Spruce near 33d St., Pittsburg, Pa.

HAUCK-Seebach Co., 291-295 Essex St., Brooklyn, N. Y.

MANUFACTURERS' Can Co., 434 Mulberry St., Newark, N. J.

MAPLE City Mfg. Co., Monmouth, Ill.

MOSHER Sales Co., 32 St. Paul St., Rochester, N. Y.
(See page 93.)

NOERA Mfg. Co., Waterbury, Conn.

PIGOT, Sayre & Co., 135 William St., N. Y. City.

SCOVILL Mfg. Co., Waterbury, Conn.

SULLIVAN Oil Co., 48 Wells St., Chicago, Ill.

TOWER & Lyon Co., 95 Chambers St., N. Y. City.

WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill.

OIL CUPS

ACORN Brass Mfg. Co., Green, Fulton and Peoria Sts., Chicago, Ill.

AMERICAN Injector Co., Detroit, Mich.

AMERICAN Lubricator Co., 93 Catherine St., Detroit, Mich.

AURORA Automatic Machinery Co., 421 Claim St., Aurora, Ill.

BAY State Stamping Co., 380 Chandler St., Worcester, Mass.

BOWEN Mfg. Co., 16 Canal St., Auburn, N. Y.
(See page 93.)

DETROIT Lubricator Co., Lincoln Ave. and G. T. R. R., Detroit, Mich.

ERIE Stamping & Mfg. Co., Erie, Pa.

ESSEX, G B., Brass Co., 480 Franklin St., Detroit, Mich.

LAVIGNE Mfg. Co., Detroit, Mich.

LUNKENHEIMER Co. (The), 213-23 E. 8th St., Cincinnati, O.

PENBERTHY Injector Co., 22 Abbott St., Detroit, Mich.

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill.
(See page opposite.)

SHERWOOD Mfg. Co., Elmwood Ave. & Belt Line, Buffalo, N. Y.

SPENCE Mfg. Co., 279 Park St., Milwaukee, Wis.

STAR Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

TUCKER, C. F., 302 Asylum St., Hartford, Conn.

WILLIAMS Valve Co., The D. T., 521-23 Hunt St., Cincinnati, O.

WINKLEY Co. (The), 226 Abbott St., Detroit, Mich.

AMERICAN Motor Parts Co., 21-23-25 Plymouth Court, Chicago, Ill.
(See page 113.)

OIL GUNS

AMERICAN Motor Parts Co., 21-23-25 Plymouth Court, Chicago, Ill.
(See page 113.)

CODMAN & Schurtleff, 120 Boylston St., Boston, Mass.

COLUMBIA Lubricants Co. of New York, 78 Broad St., N. Y. City.
(See page 131.)

ELKHART Brass Mfg. Co., Prospect St., Elkhart, Ind.

GLEASON-Peters Air Pump Co., Mercer & Houston Sts., New York.

HAUCK-Seebach Co., 291-295 Essex St., Brooklyn, N. Y.

MANHATTAN Screw & Stamping Works, 67th St. & West End Ave., N. Y. City.

McRAE & Roberts Co. (The), 227-235 Campbell Ave., Detroit, Mich.

MILLER Mfg. Co., Peekskill, N. Y.

MOSHER Sales Co., 32 St. Paul St., Rochester, N. Y.
(See page 93.)

NEW YORK & New Jersey Lubricants Co., 14 Church St., N. Y. City.

NOERA Mfg. Co., Waterbury, Conn.

RANDALL-Faichney Co., Boston, Mass.
(See page 93.)

OIL-HOLE COVERS

BAY State Stamping Co., 380 Chandler St., Worcester, Mass.

BOWEN Mfg. Co., 16 Canal St., Auburn, N. Y.
(See page 93.)

TUCKER, C. F., 302 Asylum St., Hartford, Conn.

WINKLEY Co. (The), 226 Abbott St., Detroit, Mich.

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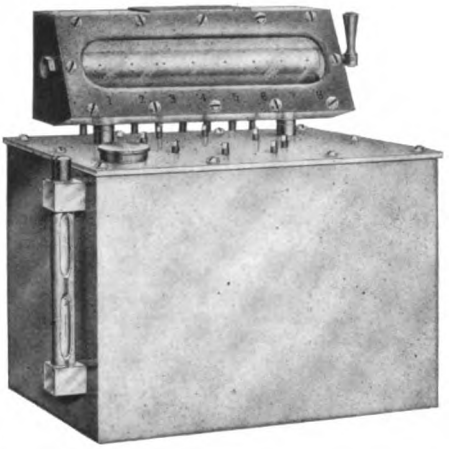

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DETROIT Lubricator Co., Lincoln Ave. and G. T. R. R., Detroit, Mich.

EASTERN Oil Tank Co., 136 Fletcher St., Lowell, Mass.
(See page opposite.)

ESSEX Brass Co., G. B., 480 Franklin St., Detroit, Mich.

HAUCK-Seebach Co., 291-295 Essex St., Brooklyn, N. Y.

IMPERIAL Brass Mfg. Co., 247 So. Jefferson St., Chicago, Ill.

LAVIGNE Mfg. Co., Detroit, Mich.

MADISON-Kipp Mfg. Co., Madison, Wis.

MANZEL Bros. Co., 313 Babcock St., Buffalo, N. Y.
(See page 119.)

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 11.)

MICHIGAN Lubricator Co., 661 Beaubien St., Detroit, Mich.

NATIONAL Cycle Mfg. Co., Bay City, Mich.

NATIONAL Oil Pump & Tank Co., Inc. (The), 411-13 E. First St., Dayton, O.

NOERA Mfg. Co., Waterbury, Conn.

OHIO Brass Co., Mansfield, Ohio.

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill.
(See page 135.)

SHERWOOD Mfg. Co., Elmwood Ave. & Belt Line, Buffalo, N. Y.

STAR Brass Mfg. Co., 108-114 E. Dedham St., Boston, Mass.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WESTERN Oil Pump Co., 2447 Kosciusko St., St. Louis, Mo.

WILLIAMS Valve Co., The D. T., 521-23 Hunt St., Cincinnati, Ohio.

PACKING

AMERICAN Steam Packing Co., Boston, Mass.

BOOTH, N. E., 743-45 39th St., Brooklyn, N. Y.
(See page 75.)

BOSTON Woven Hose & Rubber Co., 29 Hampshire St., Cambridge, Mass.

CHESTERTON & Co., A. W., 64 India St., Boston, Mass.

CHICAGO Rawhide Mfg. Co., 75-77 Ohio St., Chicago, Ill.

EAGLE Oil & Supply Co., 104 Broad St., Boston, Mass.

GOULD Packing Co., 88 E. Cambridge St., E. Cambridge, Mass.

GREENE, Tweed & Co., 109 Duane St., N. Y. City.

JOHNS-Manville Co., H. W., 100 William St., N. Y. City.

KEASBEY, Robert A., 83 Warren St., N. Y. City.

KEASBY & Mattison Co., Ambler, Pa.

NEW JERSEY Asbestos Co., Camden, N. J.

NEW JERSEY Car Spring & Rubber Co., Wayne and Brunswick Sts., Jersey City, N. J.

SMOOTH-ON Mfg. Co., 572-574 Communipaw Ave., Jersey City, N. J.

PAINTS

ACME White Lead & Color Works, Detroit, Mich.

ADAMS & Elting Co., 155 Washington Blvd., Chicago, Ill.

BERRY Bros., Ltd., Detroit, Mich.

BILLINGS-Chapin Co. (The), Cleveland, O.

BUFFALO Enamel & Stain Co., 70-72 W. Genesee St., Buffalo, N. Y.

DETROIT White Lead Wks., 532 Milwaukee St., Detroit, Mich.

DITZLER Paint & Color Works, 18 Baltimore Ave., Detroit, Mich.

FELTON, Sibley & Co., 136-140 No. 4th St., Philadelphia, Pa.

HILDRETH Varnish Co., 90 West St., N. Y. City.

LUCAS & Co., John, Race & 4th Sts., Philadelphia, Pa.

MASURY & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

MURPHY Varnish Co., Chestnut & McWhorter Sts., Newark, N. J.

PATTERSON-Sargent Paint Co., Prospect & Huron Sts., Cleveland, Ohio.

SCHRACK & Co., C., 152 No. 4th St., Philadelphia, Pa.

SHERWIN-Williams Co., 100 Canal St., Cleveland, O.

VALENTINE & Co., 257 Broadway, N. Y. City.

PANELS (Wood)

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J.
(See page 17.)

BOTHNER Hardwood Moulding Co., 1945 Park Ave., N. Y. City.

DANN Bros. & Co. (The), 80-88 Franklin St., New Haven, Conn.

OHIO Scroll & Lumber Co., Covington, Ky.

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THE BEST—SAFEST—MOST ECONOMICAL.

The only MODERATE PRICED and MODERN high-grade self-measuring gasolene pump with solid steel tank on the market to-day. Not one drop of gasolene can be wasted; no evaporation whatever, as the tank is made of heavy galvanized steel that will practically last a life-time. Tank can be buried any distance from building which eliminates all danger of fire or explosion.

You are paying from five to seven cents more for each gallon of gasolene you buy than you should unless you use

"THE EASTERN."

"The Eastern" is especially adapted for retail purposes or for private garage. This outfit pumps a quart or two quarts at one stroke of the lever. It has Anti-Drip Nozzle, Shut-off Cocks and Stuffing Boxes, making evaporation impossible, and keeps your gasolene always fresh.

By far the best and cheapest outfit on the market. Its advantages are manifold. Write for details.

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PATTERN MAKERS

BALKWILL Pattern Works, 1449 E. 49th St., Cleveland, O.

FERRO Machine & Foundry Co. (The), 251 Wade Bldg., Cleveland, O.
(See page 215.)

FULTON Foundry & Machine Co., 25 Furman St., Brooklyn, N. Y.

GARDAM & Son, Wm., 45-51 Rose St., N. Y. City.

HARTFORD Pattern & Model Co., Inc. (The), 120-124 Allyn St., Hartford, Conn.

HEINDEL Mfg. Co., Hanover, Pa.

HOPSON & Chapin Mfg. Co., New London, Conn.

MANUFACTURERS Foundry Co., Waterbury, Conn.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 11.)

MODEL Pattern Works, Washington and Perry Sts., Buffalo, N. Y.

MURRAY, W. F., 28 Beach St., Boston, Mass.

OLMSTEAD Co., H. B., 663 Manhattan Ave., Brooklyn, N. Y.

PARSELL & Weed, 129-131 W. 31st St., N. Y. City.

STANDARD Pattern Works, Detroit, Mich.

PIPE

(Wrought, Iron and Steel)

BYERS & Co., A. M., Pittsburg, Pa.

CRANE Co., 519 S. Canal St., Chicago, Ill.

HARRISBURG Pipe & Pipe Bending Co., Harrisburg, Pa.

LA BELLE Iron Works, Steubenville, O.

LONGMEAD Iron Co., Conshohocken, Pa.

MARK Mfg. Co., Evanston, Ill.

NATIONAL Tube Co., 24 State St., New York, N. Y.

READING Iron Co., Reading, Pa.

SOUTH CHESTER Tube Co., Chester, Pa.

SPANG, Chalfant & Co., Inc., Wood St. and 4th Ave., Pittsburg, Pa.

UNITED STATES Tube & Iron Co., Pittsburg, Pa.

WESTERN Tube Co., Kewanee, Ill.

YOUNGSTOWN Sheet & Tube Co., Youngstown, O.

PIPE COILS

NATIONAL Pipe Bending Co., New Haven, Conn.

STANDARD Metalwork Co., Thompsonville, Conn.

WHITLOCK Coil Pipe Co. (The), Hartford, Conn.
(See page 145.)

PIPE FITTINGS

(See Fittings, Pipe)

PISTON RINGS

FERRO Machine & Foundry Co. (The), 251 Wade Bldg., Cleveland, O.
(See page 215.)

JORDEN, R. H., 110 Sheridan St., Allegheny, Pa.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio.
(See page 49.)

SPACKE Machine Co., The F. W., Indianapolis, Ind.
(See page 65.)

PLATING (Brass and Nickel)

BRIDGEPORT Electro Plating Co., Bridgeport, Conn.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

HOPSON & Chapin Mfg. Co., New London, Conn.

IDEAL Plating Co., Inc., 3 Appleton St., Boston, Mass.

MUNCIE Auto Parts Co., 700 Elliott St., Muncie, Ind.

NOONAN Tool & Machine Works, 105 E. Dow St., Rome, N. Y.

NORTMANN-Duffke Foundry Co., 26th and Layton Aves., Milwaukee, Wis.

SMITH & CO., Jos. N., 154-162 4th St., Detroit, Mich.
(See page opposite.)

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

PLATINUM

AMERICAN Platinum Works, 251 N. J. R. R. Ave., Newark, N. J.

BAKER & Co., Inc., 408-414 N. J. R. R. Ave., Newark, N. J.

CROSELMIRE & Ackor Co., 40 Walnut St., Newark, N. J.
(See page opposite.)

GOLDSMITH Bros. Smelting & Refining Co., 63-65 Washington St., Chicago, Ill.

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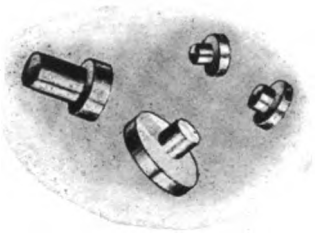

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BUFFALO Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.

CLEANER Mfg. Co., 2842 Olive St., St. Louis, Mo.

CLEANOLA Co. (The), Fulton Bldg., Pittsburg, Pa.

COLUMBIA Lubricants Co. of New York, 78 Broad St., N. Y. City.
(See page 131.)

EAGLE Mfg. Co., 383 Prospect St., Cleveland, Ohio.

HOLLINGSHEAD Co., The R. M., Camden, N. J.

KLENZENE Co., 1710-1712 Market St., Philadelphia, Pa

LEADER Mfg. Co., 1808 Chestnut St., St. Louis, Mo.

MAGIE Bros., 9 N. Canal St., Chicago, Ill.

LUCAS & Co., John, Race and 4th Sts., Philadelphia, Pa.

MODOC Co. (The), Foot of Market St., Chester, Pa.

NEWBERN Co., S. C., 430 Walnut St., Philadelphia, Pa.

ORIENT Mfg. Co., 141 Milk St., Boston, Mass.

PURITAN Soap Co., 502 Exchange St., Rochester, N. Y.

ROYAL Lubricating Oil Co., 116 Broad St., N. Y. City.

ROYAL Polish Co., 301-303 W. 63d St., Chicago, Ill.
(See page opposite.)

SHEPPARD, W. S., 22 Lawrence St., Newark, N. J.
(See page 147.)

SPEAR'S Sons Co., The Alden, 369 Atlantic Ave., Boston, Mass.

STANLEY, John T., 652 West 30th St., N. Y. City.
(See page 155.)

SWEET, Charles F., 57-61 Market St., Hartford, Conn.

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ADAMS & Elting Co., 155 Washington Blvd., Chicago, Ill.

ALLERS & Co., Harry A., 136 Liberty St., New York.

AMERICAN Metal Polish Co., 89 Winslow Ave., West Somerville, Mass.

AUTO Shine Co., Box 94, Buffalo, N. Y.

BADGER Chemical Mfg. Co., 143 Reed St., Milwaukee, Wis.

BELL Mfg. Co. (The), 113 Morgan St., St. Louis, Mo.

BOTT Bros. Mfg. Co. (The), 166 N High St., Columbus, O.

CHILDS Co., The G. B., 499 Greenwich St., New York.

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HARVEY Chemical Co., Lafayette, Ind.

HARRIS Oil Co., A. W., 330 S. Water St., Providence, R. I.
(See back cover.)

HASSLER Co., Owen C., 565 W. Fullerton Ave., Chicago, Ill.

HINDS & Coon, 126 Pearl St., Boston, Mass.

HOFFMAN, Geo. W., 551 E. Washington St., Indianapolis, Ind.

LEADER Mfg. Co., 1808 Chestnut St., St. Louis, Mo.

LEAVITT, Gilbert, 11 India St., Boston, Mass.

LORD Polish Co., F. T., Cambridge, Mass.

LUSTRE Chemical Co., 1303 Michigan Ave., Chicago, Ill.

MARSHALL Chemical Co., 80 William St., New York.

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MOORE Co., Geo. P., 721 Golden Gate Ave., San Francisco, Cal.

NATIONAL Cement & Rubber Mfg. Co., 3053 Monroe St., Toledo, O.

NEWBERN Co., S. C., 430 Walnut St., Philadelphia, Pa.

NOXAL Polish Mfg. Co., 1238 Belmont Ave., Philadelphia, Pa.

PAUL, J. C., & Co., 59 Dearborn St., Chicago, Ill.

RAIMES & Co., 50 Ferry St., N. Y. City.
(See page opposite.)

RATH Mfg. Co., Hancock, Laurel and Second Sts., Philadelphia, Pa.

ROYAL Lubricating Oil Co., 116 Broad St., New York City.

SHEPPARD, W. S., 22 Lawrence St., Newark, N. J.
(See page 147.)

YOUNG, Orlando W., 180 Frelinghuysen Ave., Newark, N. J.
(See page opposite.)

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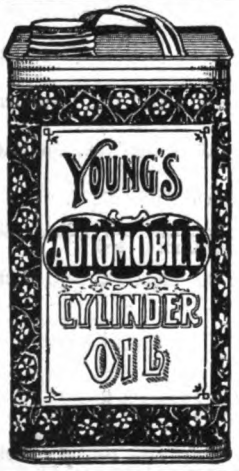

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IMPERIAL Porcelain Works (The), Trenton, N. J.

NATIONAL Porcelain Co., Trenton, N. J.

PASS & Seymour, Syracuse, N. Y.

STANDARD China Works, Trenton, N. J.

STAR Porcelain Co., Trenton, N. J.

PORTABLE CRANES AND HOISTS

FRANKLIN Portable Crane & Hoist Co., Franklin, Pa.

NICHOLLS, Wm. S., 253 Broadway, New York City.

NILES-Bement-Pond Co., 111 Broadway, N. Y. City.

PRESSED STEEL PRODUCTS

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O.
(See page 223.)

BOSTON Pressed Metal Co., 171-73 Union St., Worcester, Mass.

CRISPIN Sheet Metal Mfg. Co., 3038-3046 Chestnut St., Philadelphia, Pa.

CROSBY Co. (The), Buffalo, N. Y.
(See page 167.)

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

HYDRAULIC Pressed Steel Co., Cleveland, O.
(See cover.)

JANNEY, Steinmetz & Co., 4th and Market Sts., Philadelphia, Pa.
(See page 245.)

KEIM Mills (Inc.), John R., Liberty and Kensington Ave., Buffalo, N. Y.

KINSEY Mfg. Co., 1126 E. 3rd St., Dayton, O.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio.
(See page 49.)

McKEEL & Co., Ltd., Geo. A., Jackson, Mich.

METAL Specialties Mfg. Co., 18-24 W. Randolph St., Chicago, Ill.

MOSSBERG Co., Frank, Attleboro, Mass.

NORTMANN-Duffke Foundry Co., 26th and Layton Aves., Milwaukee, Wis.

PARISH & Bingham Co., Cleveland, O.
(See page 81.)

SMITH Co., A. O., Milwaukee, Wis.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page opposite.)

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GOODRICH, B. F., Co., Akron, Ohio.

JUDD & Leland Mfg. Co., Clifton Springs, N. Y.

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PARK City Brass Co., Springfield, Mass.

SCHRAEDER Sons, Inc., A., 30-32 Rose St., N. Y. City.

STEVENS & Co., 99 Chambers St., N. Y City.

YOUSE, E. S., 46 N. 5th St., Reading, Pa.

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BRIDGEPORT Brass Co., Bridgeport, Conn.

CHRISTENSEN, N. A., 1212 Harman Bldg., Milwaukee, Wis.

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HENION & Hubbell, 69 N. Jefferson St., Chicago, Ill.

LEATHER and Brass Mfg. Co., Auburn, N. Y.

REASON Automatic Air Pump Co., Pontiac, Mich.

RUMSEY & Co., Seneca Falls, N. Y.

SHAFFER Machine & Mfg. Co. (The), 211 No. Calvert St., Baltimore, Md.

UNION Steam Pump Co., Battle Creek, Mich.

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Hood Blinds
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TRADE MARK

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AUTO & Power Appliance Co. (The), The Arcade, Cleveland, O. (See page 255.)

BRENNAN Motor Co., Syracuse, N. Y.

BROWN & Sharpe Mfg. Co., Providence, R. I.

BYRNE, Kingston & Co., Kokomo, Ind.

ESSEX Brass Co., G. B., 480 Franklin St., Detroit, Mich.

GARVIN Machine Co., Spring & Varick Sts., N. Y. City.

IMPERIAL Brass Mfg. Co., 247 So. Jefferson St., Chicago, Ill.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio. (See page 49.)

LIPMAN Mfg. Co. (The), 210 Pleasant St., Beloit, Wis.

LOBEE Pump & Machinery Co., 133-41 Terrace, Buffalo, N. Y.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (See page 11.)

MIETZ, A., 138 Mott St., N. Y. City.

MILWAUKEE Motor Co., 615 Clybourn Ave., Milwaukee, Wis.

NEW YORK Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.

OBERDORFER Brass Co., M. L., 804 E. Water St., Syracuse, N. Y.

PELTON Gasoline Engine Wks., Lyons, Ia.

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill. (See page 135.)

PURITAN Machine Co., 12-16 Gratiot Ave., Detroit, Mich.

ROSS, H. S., 5607 So. Halsted St., Chicago, Ill.

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VERSTRAETE Mfg. Co., Ed., 421 Clinton St., Milwaukee, Wis.

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See Tire Inflators (Pump),

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BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J. (See page opposite.)

DETROIT Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich. (See page 73.)

FEDDERS Mfg. Works, Buffalo, N. Y. (See page 175.)

HAYES Mfg. Co., 360-70 Maybury Ave., Detroit, Mich. (See page 73.)

KELLS Mfg. Co., W. J., 60-62 Van Winkle Ave., Jersey City, N. J.

KINSEY Mfg. Co., 1126 E. 3rd St., Dayton, O.

LIVINGSTON Radiator Co., 10 E. 31st St., N. Y. City.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

LONG-Turney Mfg. Co., Rome, N. Y.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (See page 11.)

MAYO Radiator Co., New Haven, Conn. (See page opposite.)

METAL Stamping Co., 243 West St., N. Y. City.

NEUSTADT Auto & Supply Co., St. Louis, Mo. (See page 90.)

STANDARD Metalwork Co., Thompsonville, Conn.

WOLVERINE Radiator Co., Detroit, Mich.

WHITLOCK Coil Pipe Co. (The), Hartford, Conn. (See page opposite.)

WRIGHT Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill.

RIMS (Removable)

CRESCENT Parts Co., 1743 Broadway, New York City.

HARTFORD Suspension Co., 67 Vestry St., N. Y. City. (See page 153.)

REPUBLIC Rubber Co. (The), Youngstown, Ohio.

RIMS (Steel)

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

BRYANT Steel Wheel & Rim Co., 454 Hayden Bank Bldg., Columbus, O.

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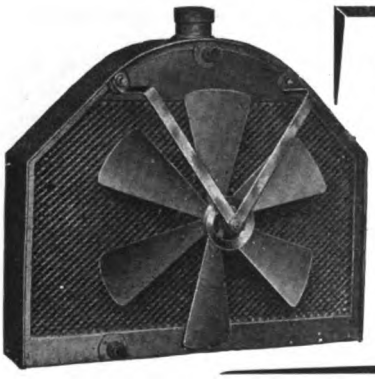

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(See page 155.)

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MIDGLEY Mfg. Co., Doublin Ave. and Hocking St., Columbus, O.

PEUGEOT Freres, 296 Broadway, N. Y. City.

STANDARD Welding Co. (The), Cleveland, O.

TRIDENT Tire Co., 1593 Broadway, N. Y. City.

WESTON-Mott Co., Flint, Mich.

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SAKS & Co., Broadway and 33rd St., N. Y. City.

SCANDINAVIAN Fur & Leather Co., 16 W. 33rd St., N. Y. City.

SPEAR-Martin Fur Co., 41 Church St., Burlington, Vt.

STALL & Dean Mfg. Co., 19 Foundry St., Brockton, Mass.

VEHICLE Apron & Hood Co., 272 N. 4th St., Columbus, Ohio.

WALLACE Co., Hugh, Boulevard and Orleans St., Detroit, Mich.

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AMERICAN Wood Rim Co., Onaway, Mich. Hagerstown, Md.

HAGERSTOWN Spoke & Bending Co., Hagerstown, Md.

JONES & Co., Phineas, 301 Market St., Newark, N. J.
(See page 33.)

RASTETTER & Son, Louis, Ft. Wayne, Ind.

TUCKER Woodwork Co. (The), Sidney, O.

ROBES (Auto)

AMERICAN Buffalo Robe Co., Buffalo, N. Y.

BISHOP & Co., J. H., Wyandotte, Mich.

CHASE Co., L. C., New York, Chicago and Boston.
(See page 187.)

CHICAGO Auto Robe Supply Co., 155-159 Market St., Chicago, Ill.

CROSBY Frisian Fur Co., 116 Mill St., Rochester, N. Y.

DAVIS Robe Co., Inc. (The), 1307 Champlain Bldg., Chicago, Ill.

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DUSENBURY, Louis, 86-88 Worth St., New York.

GAUSLER & Starr, Philadelphia, Pa.

LAIDLAW, Jr., Wm. R., 1777 Broadway, N. Y. City.

MOORE-Smith Co., Winthrop Square, Boston, Mass.

MORAWETZ Co. (The), 343 Broadway, Milwaukee, Wis.

PARSONS Buggy Top Co., 70 W. Jackson Blvd., Chicago, Ill.

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REVILLON Freres, Inc., 19 W. 34th St., N. Y. City.

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APPLIANCE Mfg. Co. (The), 72-86 West Jackson Blvd., Chicago, Ill.
(See page 49.)

AUTO Rail & Equipment Co. (The), 113 Michigan Trust Bldg., Grand Rapids, Mich.

BARLOW Mfg. Co., Holyoke, Mass.

DOUGLAS & Lomason Co., 306 Grand River Ave., Detroit, Mich.

EMPIRE Gear & Top Co., 207 N. 22nd St., Philadelphia, Pa.

FICKLING & Co., Inc., 154 E. 57th St., N. Y. City.

HARPER Co., Walter J., 229-231 Mulberry St., Newark, N. J.

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

HUME Carriage Co., Amesbury, Mass.
(See page opposite.)

IMPERIAL Brass Mfg. Co., 247 Jefferson St., Chicago, Ill.

MASON, John A., 312 Washington St., Newton, Mass.

NEW YORK Coach & Auto Lamp Co., 794-98 10th Ave., N. Y. City.

POLSON, W. F., 22 W. Utica St., Buffalo, N. Y.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SMITH & CO., Jos. N., 154-162 Fourth St., Detroit, Mich.
(See page 139.)

TEEL Mfg. Co., 132 Main St., Medford, Mass.

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(Brass and Copper)

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CRAMP & Sons' Ship & Engine Building Co., Wm., Philadelphia, Pa.

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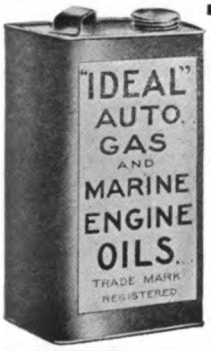

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GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

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(See page opposite.)

CHASE Co., L. C., New York, Chicago and Boston, Mass.
(See page 187.)

COMMONWEALTH Rubber Co., Reading, Mass.

EMPIRE Rubber Mfg. Co., Trenton, N. J.

FAIRFIELD Rubber Co., Fairfield, Conn.

LANDERS Bros. Co., Toledo, O., and Boston, Mass.
(See page opposite.)

MANUFACTURERS' Selling Co. (The), 1777 Broadway, N. Y. City.

MUTTY Co., L. J., 28 Summer St., Boston, Mass.
(See page opposite.)

WESTERN Rubber Co., Goshen, Ind.

RUNNING GEARS

BORBEIN Auto Co., 2107 North 9th St., St. Louis, Mo.
(See page 177.)

GARFORD Co. (The), Elyria, O.

NEUSTADT Auto & Supply Co., St. Louis, Mo.
(See page 99.)

SMITH Co., A. O., Milwaukee, Wis.

WALKER & Co., E. C. 1913 Logan St., Louisville, Ky.

DETROIT Screw Works, Detroit, Mich.
(See page 233.)

DOVER Co., Geo. W., 80 Clifford St., Providence, R. I.

ECLIPSE Machine Co., Elmira, N. Y.

ELYRIA Machine Parts Co. (The), Elyria, Ohio.

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 231.)

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

HILL Co., Geo. Q., 326 A St., Boston, Mass.

HOLT & Co., W. H., 95 Pine St., Providence, R. I.

JUDD & Leland Mfg. Co., Clifton Springs, N. Y.

LIPPINCOTT Steam Specialty & Supply Co., Newark, N. J.

McCORD & Co., 1400 Old Colony Bldg. Chicago, Ill.
(See page 11.)

McKEEL & Co., Ltd., Geo. A., Jackson, Mich.

MACHINERY Forging Co., Hamilton and Marquette Sts., Cleveland, O.

MACK Mfg. Co., Thos. A., 401-417 St. Paul Ave., Jersey City, N. J.

METAL Specialties Mfg. Co., 18-24 W. Randolph St., Chicago, Ill.

MOSSBERG Co., Frank, Attleboro, Mass.

NATIONAL-Acme Mfg. Co. (The), Cleveland, O.

NATIONAL Cycle Mfg. Co., Bay City, Mich.

NILES-Bement-Pond Co., 111 Broadway, N. Y. City.

PENINSULAR Milled Screw Co., 751 Bellevue Ave., Detroit, Mich.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WESTERN Instrument Co., 18-20 W. Randolph St., Chicago, Ill.

WORCESTER Machine Screw Co., Worcester, Mass.

SCREW MACHINE PRODUCTS

BLAKE & Johnson Co. (The), 125 E. Main St., Waterbury, Conn.

CASSADY Fairbanks Mfg. Co., 6106-30 La Salle St., Chicago, Ill.

CHICAGO Screw Co., 2 N. Canal St., Chicago, Ill.

COLUMBUS Screw & Machine Co., 244-46 Kaiser St., Columbus, Ohio.

CRITCHLEY Machine Screw Co., 25 Union St., Worcester, Mass.

SCREWS

ATLAS Bolt & Screw Co. (The), Cleveland, O.

BLAKE & Johnson Co. (The), 125 E. Main St., Waterbury, Conn.

CLEVELAND Cap Screw Co. (The), 2215 Clarkwood Rd., Cleveland, O.

CORBIN Screw Corporation (The), New Britain, Conn.

CRITCHLEY Machine Screw Co., 25 Union St., Worcester, Mass.

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DETROIT Screw Works, Detroit, Mich.
(See page 233.)

FERRY Cap & Set Screw Co. (The), 2151 Scranton Road, Cleveland, O.

HARTFORD Machine Screw Co., Hartford, Conn.
(See page 231.)

HILL Co., Geo. Q., 326 A St., Boston, Mass.

HOLT & Co., W. H., 95 Pine St., Providence, R. I.

KIRK-Latty Mfg. Co. (The), W. Madison Ave. and N. Y. C. Ry., Cleveland, O.

MANHATTAN Screw & Stamping Works, 67th St. and West End Ave., N. Y. City.

NATIONAL-Acme Mfg. Co. (The), Cleveland, Ohio.

NATIONAL Cycle Mfg. Co., Bay City, Mich.

NATIONAL Screw & Tack Co., Stanton Ave., S. E., and C. & P. Ry., Cleveland, O.

NATIONAL Sewing Machine Co., Belvidere, Ill.

PENINSULAR Milled Screw Co., 751 Bellevue Ave., Detroit, Mich.

UNION Steel Screw Co., Cleveland, O.

WATERBURY Mfg. Co., Waterbury, Conn.

WESTERN Automatic Machine Screw Co., Elyria, O.

SEATS (Auto)

AMESBURY Brass & Foundry Co., Amesbury, Mass.
(See page 187.)

COOPS Co., C. W., 3 Appleton St., Boston, Mass.

DANN Bros. Co. (The), 80-88 Franklin St., New Haven, Conn.

DAYTON Folding Tonneau Co., Dayton, O.

EMPIRE Gear & Top Co., 207 N. 22nd St., Philadelphia, Pa.

FELLWOCK Automobile & Mfg. Co. (The), 320 Upper 4th St., Evansville, Ind.

FRANTZ Body Mfg. Co. (The), Stanton Ave. and Getz St., Akron, O.

HILL Mfg. Co., 25-27 Fuller St., Buffalo, N. Y.

HUME Carriage Co., Amesbury, Mass.
(See page 147.)

ITHACA Carriage Co., Ithaca, N. Y.

MILLER & Co., A. J., Bellefontaine, O.

SCHUBERT Bros. Gear Co., 42-44 Cedar St., Oneida, N. Y.

WHIPPLE, R. W., 169 State St., Binghamton, N. Y.

SEATS (Dos-a-Dos)

INDIANAPOLIS Dash Co., Indianapolis, Ind.

SCHUBERT Bros. Gear Co., 42-44 Cedar St., Oneida, N. Y.

WHIPPLE, R. W., 169 State St., Binghamton, N. Y.

SECTORS

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

SHAFTING (Flexible)

COATES Clipper Mfg. Co., Worcester, Mass.
(See page 249.)

GEM Mfg. Co., Spruce near 33d St., Pittsburg, Pa.

STOW Flexible Shaft Co., Philadelphia, Pa

WHITE Dental Mfg. Co., S. S., 12th and Chestnut Sts., Philadelphia, Pa.

SHELLS (Boiler, Copper)

HUNGERFORD Brass & Copper Co., V. T., 497-503 Pearl St., New York, N. Y.

RANDOLPH-Clowes Co., Waterbury, Conn.

SHELLS (Boiler, Steel)

AVERY Stamping Co. (The), 5209 Lakeside Ave., Cleveland, O.
(See page 223.)

CROSBY Co. (The), Buffalo, N. Y.
(See page 167.)

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

JANNEY, Steinmetz & Co., 4th and Market Sts., Philadelphia, Pa.
(See page 245.)

PRESSED Steel Tank Co., Milwaukee, Wis.

STANDARD Welding Co. (The), Cleveland, O.

WESTERN Drop Forge Co., Marion, Ind.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

SHOCK ABSORBERS

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass.
(See page opposite.)

DIEZEMANN Shock Absorber Co., 1311 Hudson St., Hoboken, N. J.

GABRIEL Horn Mfg. Co., 1407 40th St., N. E., Cleveland, O.

GOULD-Derby Mfg. Co., 109 N. Broad St., Trenton, N. J.

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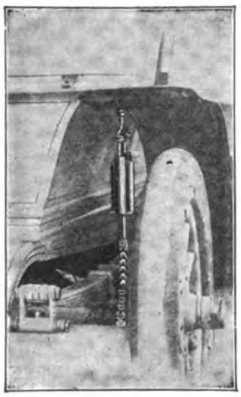

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Avoid the jar and save the car. The only Check made on real correct principles. It will check the Recoil of the spring gradually so as to avoid any unnecessary vibration to the Parts of the car and allows the rider to sit in comfort on the seat while riding rapidly over rough roads.

Saves the springs and makes riding a pleasure.

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$60.00 per set of Four

Thirty days trial allowed.

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is the most perfect of mechanical propositions in the way of Detachable Chain ever offered the trade.

Superior to anything that has ever been put on the market in design.

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For further particulars write the Company.

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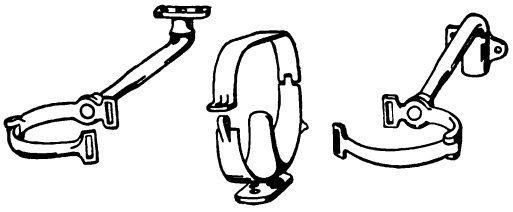

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We furnish Plain foot piece with strap or locking foot piece for single or double tires. These are an unusual, substantial, well-made article

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H. D. Simmonds, 332 Broadway, New York.
Geo. P. Moore Co., San Francisco, Cal.
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GRAHAM & Goodman, 51-55 W. 93d St., N. Y. City.

HARTFORD Suspension Co., 67 Vestry St., N. Y. City.
(See page opposite.)

HERCULES Auto Specialty Mfg. Co., 936 Denver Ave., Los Angeles, Cal.

HERZ & Co., 203-205 Lafayette St., N. Y. City.

HOTCHKIN Mfg. Co. (The), 1262 Michigan Blvd., Chicago, Ill.

INDIANAPOLIS Bolster Spring Co., 326 W. Georgia St., Indianapolis, Ind.

KILGORE Mfg. Co., Old Town, Me.

OIL Tempering Spring Co., Chicopee Falls, Mass.

RUCKERT Compound Shock Absorber Co., 66 Leonard St., N. Y. City.

SAGER Co., J. H., 265 South Ave., Rochester, N. Y.

SHIPPEY Co., Geo. E., Pittsfield, Mass.

SUPPLEMENTARY Spiral Spring Co., 4523 Delmar Ave., St. Louis, Mo.
(See page opposite.)

TRIPLE Action Spring Co., 1254 Michigan Ave., Chicago, Ill.
(See page 245.)

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

VESTAL Shock Absorber Co., Baum and Whitfield Sts., E. E., Pittsburg, Pa.

VICTOR Shock-Absorber Co., 1937 Broadway, N. Y. City.
(See page 239.)

WALKER & Co., E. C., 1913 Logan St., Louisville, Ky.

WEEBER Mfg. Works, C. F., 170-172 Central Ave., Albany, N. Y.

WERNER Car Implement Co., 110 W. 34th St., N. Y. City.

SOAPS (Auto. Body)

ACME Oil & Supply Co., 345 S. Canal St., Chicago, Ill.

AMERICAN Oil Co., 170-78 S. Water St., Jackson, Mich.

ANNIS Oil Co., N. L., 139 Potomac Ave., Buffalo, N. Y.

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 103.)

AUTO Oil Co., Jackson, Mich.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers).
(See page 191.)

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 87.)

BECKLEY-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 69.)

CLEANOLA Co. (The), Fulton Bldg., Pittsburg, Pa.

EXCELSIOR Supply Co., 233-37 Randolph St., Chicago, Ill. (Dealers and Jobbers).
(See page 71.)

FAIRCHILD & Bros., M. H., 119 Michigan St., Chicago, Ill.

FLASH Chemical Specialty Co., 7-9 Fulton Place, Boston, Mass.

FRANCO-American Auto & Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 77.)

HOLLINGSHEAD Co., The R. M., Camden, N. J.

KLENZENE Co., 1710 Market St., Philadelphia, Pa.

MODOC Co. (The), Ft. of Market St., Chester, Pa.

MONAHAN Antiseptic Co., 92 Market St., Chicago, Ill.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 101.)

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers).
(See page 239.)

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers).
(See page 99.)

NEW York Sporting Goods Co., 17 Warren St., N. Y. City (Dealers and Jobbers).
(See page 205.)

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers).
(See page 95.)

PURITAN Soap Mfg. Co., 502 Exchange St., Rochester, N. Y.

ROYAL Lubricating Oil Co., 116 Broad St., N. Y. City.

SPEARS Sons' Co., The Alden, 369 Atlantic Ave., Boston, Mass.

STANLEY, John T., 652 West 30th St., N. Y. City.
(See page 155.)

SWEET, Charles F., 57-61 Market St., Hartford, Conn.

WHITE & Bagley Co. (The), 100 Foster St., Worcester, Mass.

YOUNG, Orlando W., 180 Frelinghuysen Ave., Newark, N. J.
(See page 141.)

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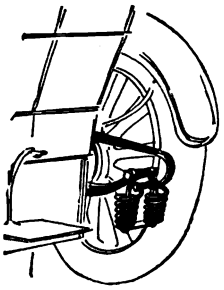

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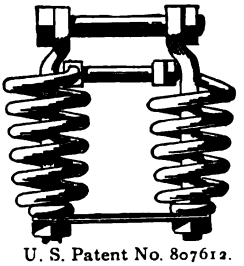

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ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 103.)

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers).
(See page 191.)

AUTO Oil Co., Jackson, Mich.

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 87.)

BADGER Chemical Mfg. Co., 143 Reed St., Milwaukee, Wis.

BAUM'S Castorine Co., Rome, N. Y.

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 69.)

CROSS, W. H., 18 Franklin St., Brooklyn, N. Y.

ERICKA Mfg. Co., Inc., Springfield, Mass.

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill. (Dealers and Jobbers).
(See page 71.)

FISK Mfg. Co., Springfield, Mass.

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 77.)

HYDRO-Palm Soap Co., 22 Minott St., Neponsett, Mass.

JERGENS Co., The Andrew, Cincinnati, O.

KIRK & Co., J. S., Chicago, Ill.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers).
(See page 101.)

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers).
(See page 239.)

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers).
(See page 99.)

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers).
(See page 205.)

POPE Mfg. Co., Hartford, Conn. (Dealers and Jobbers).
(See page 95.)

ROME Soap Mfg. Co., Rome, N. Y.

SKAT Mfg. Co., 791 Park St., Hartford, Conn.

STANLEY, John T., 652 West 30th St., N. Y. City.
(See page opposite.)

UTILITY Co. (The), 332 Broadway, N. Y. City.

WALTKE & Co., Wm., Grand and 2d St., St. Louis, Mo.

WHITE & Bagley Co. (The), 100 Foster St., Worcester, Mass.

SOLDER

COLUMBIA Smelting & Refining Works, 307 Water St., N. Y. City.

GARDINER Metal Co., 454-456 W. Lake St., Chicago, Ill.

GROUT Bros. Automobile Co., Orange, Mass.

LUMEN Bearing Co., Lathrop St., Buffalo, N. Y.
(See page 117.)

SOLDERINE Co., 53 State St., Boston, Mass.

SYRACUSE Smelting Works, 36th St. and 10th Ave., N. Y. City.

TAYLOR Co., N. & G., 308 Chestnut St., Philadelphia, Pa.

UNITED Wire & Supply Co., 109 Summer St., Providence, R. I.

WILDES, Thomas, 246 Water St., N. Y. City.

SOLDER (Aluminum)

CLUM & Atkinson, 575 Lyell Ave., Rochester, N. Y.

GROUT Bros. Automobile Co., Orange, Mass.

JANNEY, Steinmetz & Co., 4th and Market Sts., Philadelphia, Pa.
(See page 245.)

LESTER Co., F. F., Fayetteville, N. Y.

LUMEN Bearing Co., Lathrop St., Buffalo, N. Y.
(See page 117.)

SOLDERENE Company, 53 State St., Boston, Mass.

UNITED States Bronze Co. (The), 1831 Columbus Rd., Cleveland, Ohio.

SPARK COILS

AMERICAN Coil Co., Inc., Foxboro, Mass.

AMERICAN Machine Mfg. Co., 41 Lewis Wharf, Boston, Mass.
(See page 147.)

AUTOCOIL Co. (The), 132 7th St., Jersey City, N. J.

BROC-Barbier Auto Ignition Co., 143 W. 54th St., N. Y. City.

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CONNECTICUT Telephone & Electric Co., Inc., Meriden, Conn.

DAYTON Electrical Mfg. Co. (The), 87 St. Clair St., Dayton, O. (See page 113.)

DOW Portable Electric Co. (The), Braintree, Mass.

DUPLEX Coil Co., Fond-du-Lac, Wis.

ELBRIDGE Electric Co., Elbridge, N. Y.

ELECTRIC Contract Co., 202 Centre St., N Y. City.

FISCHER Special Mfg. Co., 2076 Reading Rd., Cincinnati, O.

GEEN Electrical Mfg. Co., Inc., 180 E. Lake St., Chicago, Ill.

HARDY Co., R. E., 86 Watts St., New York, N. Y. (See page 253.)

HERZ & Co., 203-205 Lafayette St., N. Y. (Importers.)

HEINZE Electric Co., Lowell, Mass. (See page opposite.)

HOLCOMBE & Co., 45 Vesey St., N. Y. City.

KNOBLOCK-Heideman Mfg. Co., South Bend, Ind.

KOKOMO Electric Co., Kokomo, Ind.

McKIBBIN, Geo. N., 94 Washington St., South Norwalk, Conn.

MANHATTAN Electrical Supply Co., 17 Park Place, New York City.

NATIONAL Coil Co., Lansing, Mich. (See page 33.)

NEVER-Miss Spark Plug Co., Lansing, Mich. (See page 115.)

NEW YORK Coil Co., 338-340 Pearl St., N. Y. City.

NOXON, C. Per Lee, 500 East Water St., Syracuse, N. Y.

OHIO Electric Works, 6304 Ellen Ave., N. W., Cleveland, O.

OSHKOSH Electric Co., Oshkosh, Wis.

PFANSTIEHL Electrical Laboratory, North Chicago, Ill.

PITTSFIELD Spark Coil Co., Dalton, Mass. (See page opposite.)

QUEEN & Co., Inc., 8th and Arch Sts., Philadelphia, Pa.

ROCHE, Wm., 40 W. Broadway, N. Y. City.

RUBAY, Leon, 1697 Broadway, New York (Importers.)

RUPRECHT Electrical Co., 7117 Cedar Ave., Cleveland, O.

SCHUG Electric Mfg. Co., 326 Jefferson Ave., Detroit, Mich. (See page 173.)

SEIDLER-Miner Electric Co., 205-209 Jefferson Ave., Detroit, Mich. (See page 33.)

SHERMAN-Lemke Coil & Supply Co., 106 Wisconsin St., Milwaukee, Wis.

SPLITDORF, C. F., 261-65 Walton Ave., New York City. (See page 115.)

THORDASEN Electric Co., 153 S. Jefferson St., Chicago, Ill.

TRITT Electrical Co. (The), Union City, Ind.

UNITED States Coil Co., 60 Harrison Ave., Jersey City, N. J.

WESTERN Electric Co., 259 S. Clinton St., Chicago, Ill.

WILLIAMS, E. Q., 531 S. Clinton St., Syracuse, N. Y.

WILLYOUNG Appliance Co., Ludlow Station, Yonkers, N. Y. (See page 161.)

SPARK GAPS

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill. (Dealers and Jobbers). (See page 103.)

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (Dealers and Jobbers). (See page 191.)

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill. (Dealers and Jobbers). (See page 87.)

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill. (Dealers and Jobbers). (See page 69.)

FRANCO-American Auto and Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. (Dealers and Jobbers). (See page 77.)

HERZ & Co., 203-205 Lafayette St., N. Y. City.

MOSLER & Co., A. R., 163 W. 29th St., N. Y. City.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (Dealers and Jobbers). (See page 101.)

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City (Dealers and Jobbers). (See page 239.)

NEUSTADT Auto & Supply Co., St. Louis, Mo. (Dealers and Jobbers). (See page 95.)

NEW York Sporting Goods Co., 17 Warren St., New York (Dealers and Jobbers). (See page 99.)

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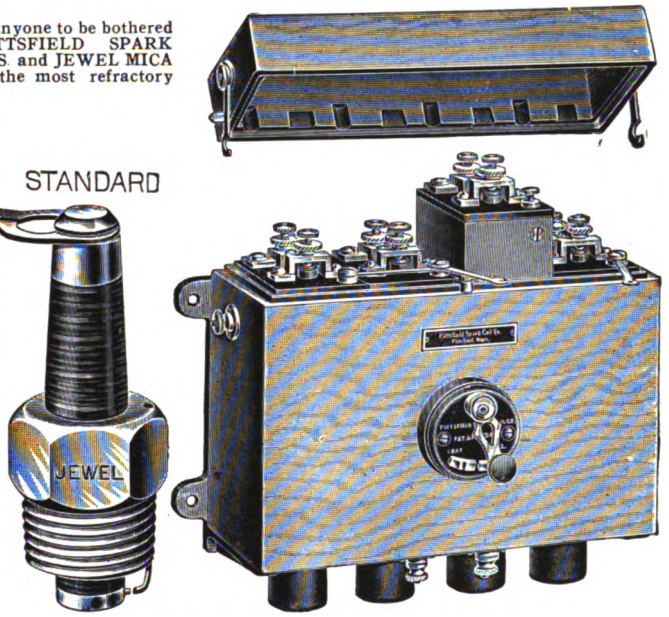

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Eastern Distributing House, The New York Sporting Goods Co., 17 Warren Street, New York City

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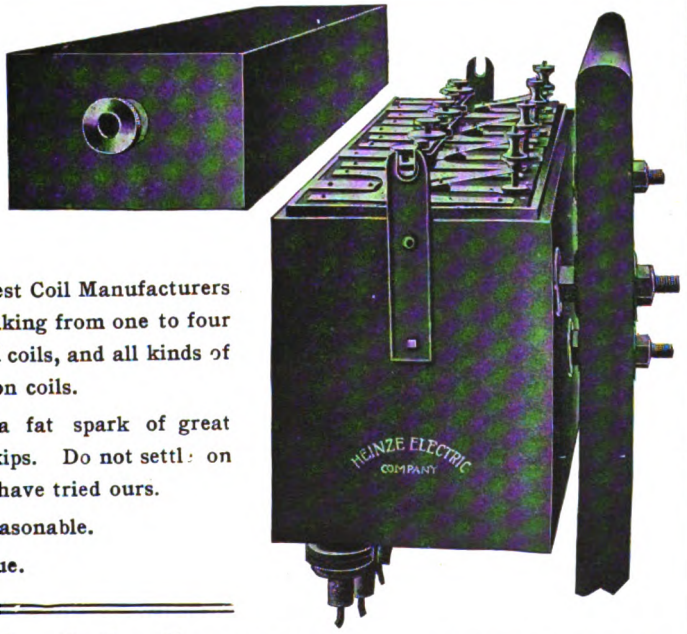

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Our coil gives a fat spark of great frequency, never skips. Do not settle on any coil until you have tried ours.

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AMERICAN Coil Co., Inc., Foxboro, Mass.

AMERICAN Machine Mfg. Co., 41 Lewis Wharf, Boston, Mass.
(See page 147.)

ARC Spark Mfg. Co., 125 W. 32d St., N. Y. City.

ARC-Toledo Spark Plug Co. (The), Toledo, O.

ATLANTIC Motor Supply & Screw Co., 48 Binford St., Boston, Mass.

AUTO Appliance Co., 24 Mechanic St., Newark, N. J.

AUTO Novelty Co., Milwaukee, Wis.
(See page 211.)

B. & J. Mfg. Co., 3985 Cottage Grove Ave., Chicago, Ill.

BAIRD-Banks Mfg. & Supply Co., 203 Broadway, New York City.

BENFORD, E. M., 497 W. Lincoln Ave., Mount Vernon, N. Y.

BIG 4 Spark Plug Co., 104 John R St., Detroit, Mich.
(See page 105.)

BOSCH, New York, Inc., Robert, 160 W. 56th St., N. Y. City.

BROC-Barbier Auto Ignition Co., 143 West 54th St., N. Y. City.

BYRNE, Kingston & Co., Kokomo, Ind.

CHARTER & Co., 303 Dearborn St., Chicago, Ill.

CLIMAX Igniter Co., Amesbury, Mass.

DAYTON Electrical Mfg. Co. (The), 87 St. Clair St., Dayton, O.
(See page 113.)

DELTA Mfg. Co., Bloomfield, N. J.

DE LUXE Mfg. Co., Buffalo, N. Y.

DIEBEL, Wm., 904 Lippincott Bldg., Philadelphia, Pa.

DOW Portable Electric Co. (The), Braintree, Mass.

DUPLEX Ignition Co., Inc., 307 W. 36th St., N. Y. City.

ELBRIDGE Electric Co., Elbridge, N. Y.

EXCELSIOR Spark Plug Co., Cleveland, O.

FISCHER Special Mfg. Co., 2076 Reading Rd., Cincinnati, O.

FRY Co., T. C. & W. L., 800 Chestnut St., Rochester, Pa.

FULMER, C. F., Plainfield, N. J.

GEEN Electrical Mfg. Co., Inc., 180 E. Lake St., Chicago Ill.

GERSON-Carey Co., Lansing, Mich.

GENERATOR Valve Co., 294-96 Taaffe Place, Brooklyn, N. Y.

GRANT Mfg. & Machine Co. (The), 90 Silliman Ave., Bridgeport, Conn.

HARDY Co., R. E., 86 Watts St., N. Y. City.
(See page 253.)

HERBERT, W. H., 3312 Wabash Ave., Chicago, Ill.

HERZ & Co., 203-05 Lafayette St., N. Y. City.

HOLCOMBE & Co., 45 Vesey St., N. Y. City.

HUB Lubricator Co., Portland Bldg., Boston, Mass.
(See page 141.)

IGNITER Appliance Co., 133 Central Ave., Cleveland, O.

JANNEY, Steinmetz & Co., 4th and Market Sts., Philadelphia, Pa.
(See page 245.)

KENT Spark Plug Co., 621 Broadway, N. Y. City.
(See page 15.)

KNOBLOCK-Heideman Mfg. Co., South Bend, Ind.

KOKOMO Electric Co., Kokomo, Ind.

LIPMAN Mfg. Co. (The), 210 Pleasant St., Beloit, Wis.

McCANNA Mfg. Co., 56 N. Jefferson St., Chicago, Ill.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 11.)

METAL Specialties Mfg. Co., 18-24 W. Randolph St., Chicago, Ill.

MEZGER, Inc., C. A., 40 West 60th St., N. Y. City.
(See page 9.)

MOSLER, A. R., & Co., 163 W. 29th St., N. Y. City.

NEVER-Miss Spark Plug Co., Lansing, Mich.
(See page 115.)

NORTH & Pfeiffer Mfg. Co., 72 Chestnut St., New Britain, Conn.

OAKES & Dow Co. (The), 15 Chardon St., Boston, Mass.

ORSWELL Ignition Co. (The), 102 Pearl St., Boston, Mass.

PEERLESS Equipment Co., 170 S. Clinton St., Chicago, Ill.

PIONEER Brass Works, 424 S. Penna. St., Indianapolis, Ind.

PITTSFIELD Spark Coil Co., Dalton Mass.
(See page 157.)

PROGRESSIVE Mfg. Co., 41 Norwood St., Torrington, Conn.

PURITAN Machine Co., 12-16 Gratiot Ave., Detroit, Mich.

RAJAH Auto Supply Co., 140 Washington St., New York City.

REX Motor Co., Detroit, Mich.

RICHARDSON Engineering Co., 6 Ford St., Hartford, Conn.
(See page 219.)

ROBERT Instrument Co., 49 Shelby St., Detroit, Mich.
(See page 29.)

ROCHE, Wm., 40 W. Broadway, N. Y. City.

RUBAY, Leon, 1697 Broadway, New York City (Importer).

SCHUG Electric Mfg. Co., 326 Jefferson Ave., Detroit, Mich.
(See page 173.)

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DEALERS

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April 2, 1907.

Gentlemen:—I have been using your spark plug for past six months in my sixty horse-power touring car. The engine, which is an exact duplicate of my engine in Green Dragon, is a very hot engine; therefore it is necessary for me to use plenty of oil. Therefore I find your spark plug the finest I ever used, being a hard matter to foul and so easy to clean once you do foul.

Yours truly,
BARNEY OLDFIELD

ADVANTAGES

One-sixth turn of the handle opens.
Entire porcelain is exposed for cleaning.
One twist makes instantly white.
Locks with the push of a finger.
Tight to 2,000 pounds.
No wrench to get, use or replace.
Terminal clips with each plug.
No thumb-nuts to loosen. No pliers.
Stuffing nut chambered.
Plugs held by their handle in testing.
Not balanced on edge of your engine.
Soot-proof to the limit.
Unaffected by oil.
Chambered end protects porcelain.
Keeps porcelain fragments from cylinder.
Slightest piston movement cleans points.
Makes starting easy; fires first charge.
Big cars run slow on high gear.
Closely throttled; not a skip.

Every possible requirement completely satisfied. Better value than any other plug made. Write for booklet of this famous spark plug that can be cleaned in less than 4 seconds.

Made by **THE STANDARD CO., Torrington, Conn.**

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(See page 33.)

SHERMAN-Lemke Coil & Supply Co., 106 Wisconsin St., Milwaukee, Wis.

SPLITDORF, C. F., 261-65 Walton Ave., New York City.
(See page 115.)

STANDARD Co. (The), Torrington, Conn.
(See page 159.)

THURSTON Mfg. Co. (The), 356 E. 57th St., Chicago, Ill.

TRITT Electric Co. (The), Union City, Ind.

TRIUMPH Engineering Co., 226 Lafayette St., New York City.

UNITED States Coil Co., 60 Harrison Ave., Jersey City, N. J.

WILLIAMS, E. G., 531 S. Clinton St., Syracuse, N. Y.

WILLYOUNG Appliance Co., Ludlow Station, Yonkers, N. Y.
(See page opposite.)

SPARKING POINTS

AMERICAN Platinum Wks., 251 N. J. R. R. Ave., Newark, N. J.

BAKER & Co., Inc., 408-414 N. J. R. R. Ave., Newark, N. J.

BOKER & Co., Herman, 101 Duane St., N. Y. City.

CROSELMIRE & Ackor Co., 40 Walnut St., Newark, N. J.
(See page 139.)

IDIUM Metals Co., Boston, Mass.
(See page 241.)

QUEEN & Co., Inc., 8th and Arch Sts., Philadelphia, Pa.

SPARK TIMING DEVICES

ALTEMUS & Co., C. L., Fourth and Locust Sts., Philadelphia, Pa.

AMERICAN Coil Co., Inc., Foxboro, Mass.

AUTO Appliance Co., 24 Mechanic St., Newark, N. J.

AUTO Instrument Co., 228 No. 4th St., Philadelphia, Pa.

AUTO & Power Appliance Co. (The), The Arcade, Cleveland, O.
(See page 255.)

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill.
(See page 69.)

BEMUS, Inc., T. Alton, 360 Atlantic Ave., Boston, Mass.
(See page 23.)

BLACK, A. B., 21 S. Market St., Boston, Mass.

BROC-Barbier Auto Ignition Co., 143 West 54th St., N. Y. City.

BURTT Mfg. Co., 128 N. Edward St., Kalamazoo, Mich.

CONNECTICUT Telephone & Electric Co., Inc., Meriden, Conn.

CROUSE-Hinds Co., 308 W. Jefferson St., Syracuse, N. Y.

DARMAC Commutator Co., 220 E. 5th St., St. Paul, Minn.

DAYTON Electrical Mfg. Co. (The), 87 St. Clair St., Dayton, O.
(See page 113.)

DODGE Lubricator Co., 8 Waltham St., Boston, Mass.

DOW Portable Electric Co. (The), Braintree, Mass.

GEEN Electrical Mfg. Co., Inc., 180 E. Lake St., Chicago, Ill.

FULMER, C. F., Plainfield, N. J.

HARDY Co., R. E., 86 Watts St., N. Y. City.
(See page 253.)

HEINZE Electric Co., Lowell, Mass.
(See page 157.)

HERBERT, W. H., 3312 Wabash Ave., Chicago, Ill.

HERZ & Co., 203-205 Lafayette St., New York.

ILLINOIS Auto & Parts Co., Globe and Main Sts., Peoria, Ill.

KENT Mfg. Works, Atwater, 50 North 6th St., Philadelphia, Pa.
(See page 115.)

KOKOMO Electric Co., Kokomo, Ind.

LINDSAY, A. M., Jr., 187 N. Water St., Rochester, N. Y.

MILWAUKEE Auto Engine & Supply Co., 706-08 Winnebago St., Milwaukee, Wis.

MONITOR Speed Recorder Co., 274 Pearl St., Cambridge, Mass.

MOSLER & Co., A. R., 163 West 29th St., N. Y. City.

NEWCOMB, A. H., 815 W. 21st St., Chicago, Ill.

PEERLESS Equipment Co., 170 S. Clinton St., Chicago, Ill.

PIONEER Brass Works, 424 S. Penna. St., Indianapolis, Ind.

PITTSFIELD Spark Coil Co., Dalton, Mass.
(See page 157.)

POWELL Muffler & Timer Co., 44 La Fayette St., Utica, N. Y.
(See page 251.)

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill.
(See page 135.)

QUAD Mfg. Co. (The), 35-37 S. Scioto St., Columbus, O.
(See page 235.)

ROBERT Instrument Co., 49 Shelby St., Detroit, Mich.
(See page 29.)

SCHAAL, W. R., 27 N. Jefferson St., Chicago, Ill.

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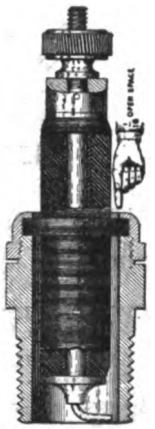

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No part of porcelains coming in contact with metal, they are free to expand and contract, and therefore will not break.
More non-short-circuiting space than any plug made.
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No asbestos or wicking to blow out.
No shellac or cement used.
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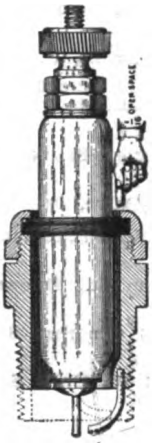

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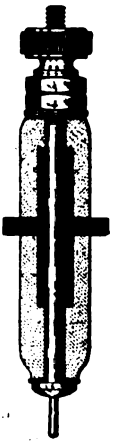

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DAVIS, S. H. & Co., 68 Portland St., Boston, Mass.

HICKS Speed Indicator Co., 1263 Atlantic Ave., Brooklyn, N. Y.

HOFFECKER Co. (The), Park Square Motor Mart, Boston, Mass.

JONES Speedometer Co., New Rochelle, N. Y.

JONES, W. H., 134 Waverley Ave., Newton, Mass.

LIPMAN Mfg. Co. (The), 210 Pleasant St., Beloit, Wis.

LITTLEFIELD Mfg. Co., W. S., 134 Eliot St., Boston, Mass.

LOMBARDI Motor Co. (The), Derby, Conn.

LORING Speed Gauge Co., 91 Marshall St., Somerville, Mass.

MILLER Speedometer Co., 97 Reade St., N. Y. City.

MONITOR Speed Recorder Co., 274 Pearl St., Cambridge, Mass.

NIAGARA Tachometer & Instrument Co., 26th and Adams Sts., Niagara Falls, N. Y.

OLIVER Instrument Co., Cor. Hennepin and 7th Sts., Minneapolis, Minn. (See page 195.)

PARKER Mfg. Co., 6 Clifton St., Boston, Mass.

ROSS Engineering Co., 19 S. Jefferson St., Chicago, Ill.

SMITH Mfg. Co., R. H., Springfield, Mass. (See page opposite.)

STEWART & Clark Mfg. Co., 514 Diversey Blvd., Chicago, Ill. (See page 25.)

VEEDER Mfg. Co., 22 Sargeant St., Hartford, Conn.

WARNER Instrument Co., 403 Roosevelt Ave., Beloit, Wis.

WEBB Mfg. Co., 60 Shipman St., Newark, N. J.

WINCHESTER Speedodometer Co., Inc., Motor Mart, 62nd St. and Broadway, N. Y. City.

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EMERGENCY Spring Repairer Co., 80 Broad St., N. Y. City.

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ARMSTRONG Mfg. Co. (The), J. B., Flint, Mich.

CLEVELAND-Canton Spring Co. (The), Canton, O.

DELANEY, D., & Son, Liberty and Hamilton Sts., Newark, N. J.

DETROIT Steel Products Co., 141 St. Antoine St., Detroit, Mich. (See cover.)

FOREST City Spring Works, Maine Ave. and Center St., Cleveland, O.

GARDEN City Spring Works, 200 Purple St., Chicago, Ill.

HARVEY Spring Co., Racine, Wis.

HESS-Pontiac Spring & Axle Co., Pontiac, Mich.

KALAMAZOO Spring & Axle Co., Kalamazoo, Mich.

KEYSTONE Spring Works, Inc., 13th and Buttonwood Sts., Philadelphia, Pa.

LEWIS Spring & Axle Co., Jackson, Mich.

MERRILL Spring Co., E. R., 530 West 23th St., New York.

PENN Spring Works, Baldwinsville, N. Y.

PERFECTION Spring Co., 2414-2420 Superior Ave., N. W., Cleveland, O. (See page 171.)

ROWLAND, Inc., Wm. & Harvey, Frankfort, Philadelphia, Pa.

SHELDON Axle Co., Wilkes-Barre, Pa.

SHULER & Son, Davis W., Amsterdam, N. Y.

SPRING Perch Co., 232 John St., Bridgeport, Conn.

TROY Spring Works, 394-96 Congress St., Troy, N. Y.

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The speedometer that is *approved* and *used* by the car owners is the speedometer for the trade.

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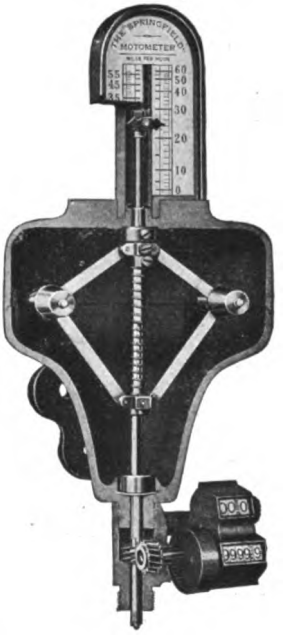

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SPRINGFIELD, MASS.

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DUNBAR Bros., Bristol, Conn.

EUREKA Spring Co., 347 Broadway, N. Y. City.

GIBSON Co., Wm. D., Huron and Kingsbury Sts., Chicago, Ill.
(See page opposite.)

HEBB, George A., 70 William St., Newark, N. J.

HUBBARD Spring Co., M. D., Pontiac, Mich.
(See page opposite.)

INDEPENDENT Steel & Wire Co., House Bldg., Pittsburg, Pa.

MILLER & Van Winkle, 18 Bridge St., Brooklyn, N. Y.

MORGAN Spring Co., Worcester, Mass.

NATIONAL Cutlery Co., Detroit, Mich.

RAYMOND Mfg. Co., Ltd., West Church St., Corry, Pa.

THOMPSON, F. H., 36-38 Elm St., Portland, Me.

WALLACE Barnes Co. (The), Bristol, Conn.
(See page opposite.)

SPRINGS (Seat)

BARBER Mfg. Co., Anderson, Ind.
(See page 217.)

CLEVELAND Wire Spring Co., Cleveland, Ohio.

D'ARCY Spring Co., Kalamazoo, Mich.
(See page 169.)

DETROIT Wire Spring Co., Detroit, Mich.
(See page opposite.)

GIBSON Co., Wm. D., Huron and Kingsbury Sts., Chicago, Ill.
(See page opposite.)

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HUBBARD Spring Co., M.D., Pontiac, Mich.
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INDEPENDENT Steel & Wire Co., House Bldg., Pittsburg, Pa.

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NATIONAL Spring & Wire Co., Albion, Mich.

NEW YORK Wire & Spring Co., 71 Park Ave., Hoboken, N. J.

STAPLES & Hanford, Newburgh, N. Y.

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(See page opposite.)

WINDSOR Spring Co. (The), Kenosha, Wis.

WING Co., Charles, Amesbury, Mass.

SPRINGS (Supplementary)

(See Shock Absorbers)

SPROCKETS

ADAPT Machinery Co. (The), 1624-30 Wabash Ave., Chicago, Ill.

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass.
(See page 151.)

BILLINGS & Spencer Co. (The), Russ and Lawrence Sts., Hartford, Conn.

BOSTON Gear Works, Norfolk Downs, Mass.

COLLMER Bros., 105 Vistula Ave., South Bend, Ind.

CULLMAN Wheel Co., 1030 Dunning St., Chicago, Ill.
(See page 45.)

DIAMOND Chain & Mfg. Co., 231 West Georgia st., Indianapolis, Ind.
(See page 61.)

FORG, Peter, Park St., Somerville, Mass.

GARFORD Co. (The), Elyria, O.

GRANT Gear Works, 6 Portland St., Boston, Mass.

HYDRAULIC Pressed Steel Co., Cleveland, O.
(See cover.)

PARISH & BINGHAM Co., Cleveland, O.
(See page 81.)

SPACKE Machine Co., The F. W., Indianapolis, Ind.
(See page 65.)

THROOP Perforating Co., 80 Terrace, Buffalo, N. Y.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

STAMPINGS

AVERY Stamping Co. (The)) 5209 Lakeside Ave., Cleveland, O.
(See page 223.)

BAY State Stamping Co., 380 Chandler St., Worcester, Mass.

BOSTON Pressed Metal Co., 171-73 Union St., Worcester, Mass.

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(See page 93.)

CASSADY-Fairbank Mfg. Co. (The), 6106-30 La Salle St., Chicago, Ill.

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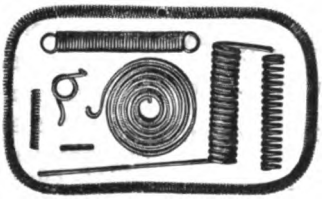

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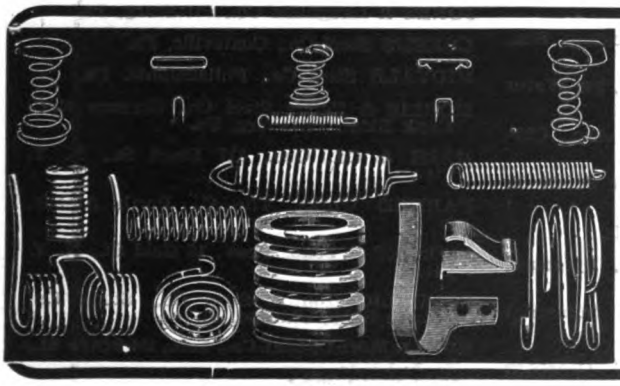

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(See page opposite.)

FORG, Peter, Park St., Somerville, Mass.

FORSYTH Mfg. Co., 308 Terrace, Buffalo, N. Y.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

HALL Co., Chas. E., 108 Broadway, Buffalo, N. Y.
(See page opposite.)

HANCOCK Inspirator Co., 85 Liberty St., N. Y. City.

HILL Co., Geo. Q., 326 A St., Boston, Mass.

HYDRAULIC Pressed Steel Co., 3152 E. 61st St., Cleveland, O.
(See cover.)

INDESTRUCTIBLE Steel Wheel Co., 1303 Michigan Ave., Chicago, Ill.
(See page 221.)

JANNEY, Steinmetz & Co., 4th and Market Sts., Philadelphia, Pa.
(See page 245.)

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio.
(See page 49.)

McKEE & Co., Ltd., Geo. A., Jackson, Mich.

MANHATTAN Screw & Stamping Works, 67th St. and West End Ave., N. Y. City.

MACK Mfg. Co., Thos. A., 401-417 St. Paul Ave., Jersey City, N. J.

MATTHEWS, H. A., Mfg. Co., Seymour, Conn.

METAL Specialties Mfg. Co., 18-24 W. Randolph St., Chicago, Ill.

MOSSBERG Co., Frank, Attleboro, Mass.

NORTMANN-Duffke Foundry Co., 26th and Layton Aves., Milwaukee, Wis.

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(See page 81.)

PARISH Mfg. Co., 7th and Chestnut Sts., Reading, Pa.

PITTSBURG Gauge & Supply Co., 309 Water St., Pittsburg, Pa.

SIDNEY Mfg. Co., 5300 Armour Ave., Chicago, Ill.

SIMMONS Co., John, 104-10 Centre St., N. Y. City.

SMITH Co., A. O., Milwaukee, Wis.

SNOW, B. W., 132 Bissell St., Syracuse, N. Y.

STANDARD Gauge Mfg. Co., Industrial Bldg., Syracuse, N. Y.

STAR Brass Mfg. Co., 108-14 E. Dearborn St., Boston, Mass.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

WESTERN Instrument Co., 18-20 W. Randolph St., Chicago, Ill.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

STARTERS (Automatic)

AUTO Improvement Co., 316 Hudson St., New York City.

BALL, F. H. & F. O., Plainfield, N. J.

KANE Starting Device Co., 762 Junction Ave., Detroit, Mich.

MILNE Auto-Start Co., 812 4th Ave., Detroit, Mich.

STEEL

AMERICAN Sheet Steel Co., 24 State St., N. Y. City.

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

BASSETT-Pressley Co., Cleveland, O.

BETHLEHEM Steel Co., So. Bethlehem, Pa.

BOKER & Co., Herman, 101 Duane St., N. Y. City.

BRAEBURN Steel Co., Braeburn, Pa.

CAMBRIA Steel Co., Philadelphia, Pa.

CARPENTER Steel Co. (The), Reading, Pa.

COLUMBIA Steel Co., Elyria, O.

CRUCIBLE Steel Co. of America, Empire Bldg., Pittsburg, Pa.

ELIOTT-Blair Steel Co., Taylor and Mercer Sts., New Castle, Pa.

FARIST Steel Co. (The), 137 E. Main St., Bridgeport, Conn.

FINISHED Steel Co. (The), 1623 Wilson Ave., Youngstown, O.

JONES & Laughlins Co., Pittsburg, Pa.

LUKENS Steel Co., Coatsville, Pa.

MIDVALE Steel Co., Philadelphia, Pa.

MORRIS & Bailey Steel Co., German Nat'l Bank Bldg., Pittsburg, Pa.

NASH & Co., Geo., 217 Pearl St., N. Y. City.

PARDEE Works, The C., Perth Amboy, N. J.

PROSSER & Sons, Thos., 15 Gold St., N. Y. City.

REPUBLIC Iron & Steel Co., Stock Exchange Bldg., Chicago, Ill.

ROYAL Metal Steel Co., Inc., 24 State St., N. Y. City.
(See page 243.)

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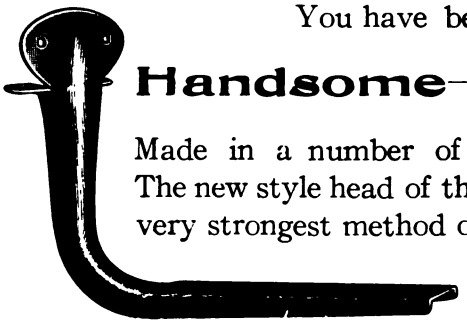
STAMPED STEEL STEP HANGER



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STANDARD Gauge Steel Co., Beaver Falls, Pa.

SUPERIOR Steel Co., Carnegie, Pa.

TAYLOR Co., N. & G., 308 Chestnut St., Philadelphia, Pa.

UNION Drawn Steel Co., Beaver Falls, Pa.

UNITED Steel Co. (The), Canton, O.

WARD & Sons, Edgar T., 25 Purchase St., Boston, Mass.

STEEL (Chrome-Nickel)

BETHLEHEM Steel Co., So. Bethlehem, Pa.

CARPENTER Steel Co. (The), Reading, Pa.

COLUMBIA Steel Co., Elyria, O.

GAUTIER & Co., D. G., 20 Cliff St., New York.

JOHNSON & Co., Isaac G., Spuyten Duyvil, New York City.

MIDVALE Steel Co., Philadelphia, Pa.

NEW Process Steel Co. (The), Marshall, Mich.

ORFORD Copper Co., 43 Exchange Place, N. Y. City.

PARISH Mfg. Co., 7th and Chestnut Sts., Reading, Pa.

PROSSER & Sons, Thomas, 15 Gold St., New York (Importers).

ROYAL Metal Steel Co., Inc., 24 State St., N. Y. City.
(See page 243.)

TINDEL-Morris Co., Eddystone, Pa.

WORCESTER Steel Foundry Co., Millbury, Mass.

STEEL SHAFTING

AMERICAN Steel & Wire Co., The Rookery, Chicago, Ill.

COLUMBIA Bridge Co., Pittsburg, Pa.

CUMBERLAND Steel Co., Cumberland, Md.

UNION Drawn Steel Co., Beaver Falls, Pa.

STEEL SHEETS
(Aluminum Coated)

AMERICAN Aluminum Coating Co., 1004 Diamond Bank Bldg., Pittsburg, Pa.

STEEL STAMPS AND STENCILS

CHANDLER Co. (The), 31 Taylor St., Springfield, Mass.

MONOGRAM Crest & Sign Co., 1937 Broadway, N. Y. City.

MURDOCK, Jr., Co., Jas., 116 Opera Pl., Cincinnati, O.

NEW YORK Stencil Works, 100 Nassau St., N. Y. City.

QUINT & Sons, S. H., 15 S. 4th St., Philadelphia, Pa.

ROBBINS Mfg. Co., John, 58 Kneeland St., Boston, Mass.

SMITH Mfg. Co., The R. H., Springfield, Mass.
(See page 163.)

STEEL WOOL

AMERICAN Steel Wool Mfg. Co., 451-453 Greenwich St., N. Y. City.

BUEHNE Steel Wool Co. (The), 98 Nassau St., N. Y. City.

STEERING APPARATUS

AMERICAN & British Mfg. Co., Bridgeport, Conn.

ASHLEY Machine Works, 714 University Ave., Rochester, N. Y.

ATLAS Drop Forge Co., Lansing, Mich.

BARNES Gear Co., Oswego, N. Y.

BILLINGS & Spencer Co. (The), Russ and Lawrence Sts., Hartford, Conn.

BLOOD Bros. Machine Co., Kalamazoo, Mich.

BORBEIN Auto Co., 2107 North 9th St., St. Louis, Mo.
(See page 177.)

BOSTON Gear Works, Norfolk Downs, Mass.

BROWN-Lipe Gear Co., Syracuse, N. Y.
(See page opposite.)

BULTMAN Co., The F. H., 2108 Superior Ave. Viaduct, Cleveland, Ohio.

CAMBRIA Forge Co., Johnstown, Pa.

COLUMBUS Screw & Machine Co., 244-46 Kaiser St., Columbus, O.

ELYRIA Machine Parts Co. (The), Elyria Ohio.

GARFORD Co. (The), Elyria, O.

GEMMER Mfg. Co., Detroit, Mich.

GENERAL Electric Co., Schenectady, N. Y.

HARTFORD Auto Parts Co., Howard Bldg., Hartford, Conn.
(See page 199.)

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Sliding Gear Transmissions

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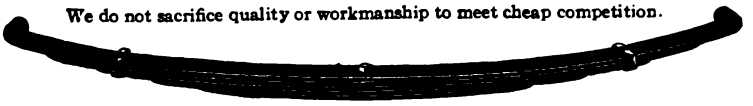

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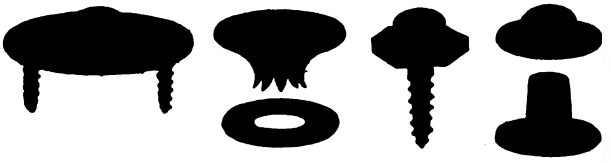

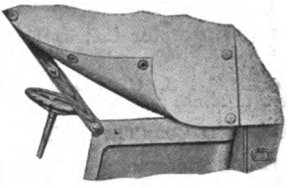

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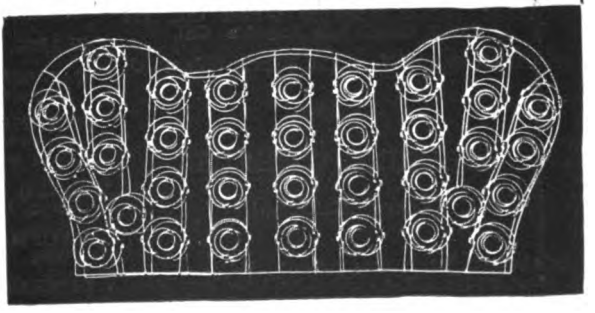

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JAMESVILLE Mfg. Co., Jamesville, N. Y.

LEE Mfg. Co. (The), Port Huron, Mich.

McCUTCHEN Gear & Mfg. Co., 205 W. South St., Indianapolis, Ind.

MEISEL Press & Mfg. Co., 944-48 Dorchester Ave., Boston, Mass.

MILNE, Frank, Crescent St., Everett, Mass.

MORSE, Williams & Co., West End Trust Bldg., Philadelphia, Pa.

NEUSTADT Auto & Supply Co., St. Louis, Mo.
(See page 99.)

OHIO Brass Co., Mansfield, Ohio.

SMITH, Chas. A., Church Lane & P. & R. Ry., Germantown, Philadelphia, Pa.

SMITH Co., A. O., Milwaukee, Wis.

TIMKEN Roller Bearing Axle Co., Canton, O.

WABASH Gear Works, 10th and Farrington Sts., Terre Haute, Ind.

WARNER Gear Co., Muncie, Ind.

STEERING WHEELS

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J.
(See page 17.)

AMERICAN Wood Rim Co., Onaway, Mich.

BRYANT & Berry Co., 34 W. Atwater St., Detroit, Mich.

BYRNE, Kingston & Co., Kokomo, Ind.

CAMBRIA Forge Co., Johnstown, Pa.

CENTAUR Motor Co., 59 Franklin St., Buffalo, N. Y.

COLEMAN, J. C., 234 Jefferson Ave., Detroit, Mich.

GARFORD Co. (The), Elyria, O.

GOERSS, Herman, 162 Russell Ave., Cleveland, O.

JAMESVILLE Mfg. Co., Jamesville, N. Y.

McCUTCHEN Gear & Mfg. Co., 205 W. South St., Indianapolis, Ind.

MEYER, Morris F., 65-69 East Woodbridge St., Detroit, Mich.
(See page 193.)

MUNCIE Auto Parts Co., Muncie, Ind.

RASTETTER & Son, Louis, Ft. Wayne, Ind.

TOWNE Patent Steering Wheel Co., 214 L. A. Trust Bldg., Los Angeles, Cal.

TUCKER Wood Work Co. (The), Sidney, O.

STEERING WHEELS
(Hard Rubber)

DIAMOND Tire Co., Akron, O.
(See page 183.)

STEPS

BILLINGS & Spencer Co. (The), Russ and Lawrence Sts., Hartford, Conn.

BLAKESLEE Forging Co., Plantsville, Conn.

CROSBY Co. (The), Buffalo, N. Y.
(See page 167.)

DRUEN, B. D., 71 Hamilton St., New Haven, Conn.

GLOBE Machine & Stamping Co. (The), Hamilton Ave., Cleveland, O.
(See page 69.)

HAYES Mfg. Co., 360-70 Maybury Ave., Detroit, Mich.
(See page 73.)

HYDRAULIC Pressed Steel Co., Cleveland, O.
(See cover.)

QUINCY, Manchester, Sargent Co., 84 Van Buren St., Chicago, Il.
(See page 111.)

RUBBER Step Mfg. Co., Exeter, N. H.

SMITH & Co., H. D., Plantsville, Conn.

STRIEBY & Foote Co., 301 Ogden St., Newark, N. J.

WESTERN Automatic Machine Screw Co. Elyria, O.

WING Co., Chas., Amesbury, Mass.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

STORM SHIELDS
(See Aprons and Curtains, Storm)

STRAINERS (Gasoline)

AMERICAN Motor Parts Co., 21-23-25 Plymouth Court, Chicago, Ill.
(See page 113.)

BREEZE Carbureter Co., 276 Halsey St., Newark, N. J.

CENTURY Specialty Co., 401 Deshler Ave., Columbus, O.

CLARK, E. P., Arcade, Utica, N. Y.

GALVIN Co., The J. F., 74-78 Fort St., E., Detroit, Mich.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

JONES, Wm. S., 1303 Michigan Ave., Chicago, Ill.

KAUFMANN, Chas., 28 Main St., Oshkosh, Wis.

LUNKENHEIMER Co. (The), Cincinnati, O

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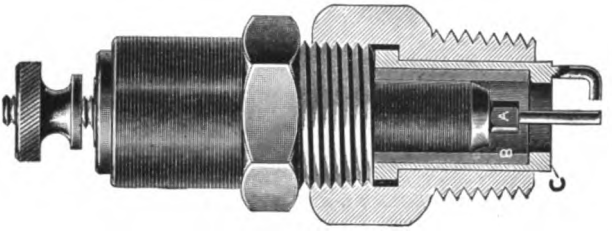

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AUTOMOBILE SPRING SPECIALISTS

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(See page 83.)

UNCAS Specialty Co., 25 Shipping St., Norwich, Conn.

WILLIAMS Valve Co., The D. T., 521-23 Hunt St., Cincinnati, O.

WINKLEY Co. (The), 226 Abbott St., Detroit, Mich.

SUPPLIES
(Dealers and Jobbers)

ARNSTEIN, Eugene, 35th St. and Shields Ave., Chicago, Ill.
(See page 103.)

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich.
(See page 191.)

AUTOMOBILE Supply Co. (The), 1339 Michigan Ave., Chicago, Ill.
(See page 87.)

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill.
(See page 69.)

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill.
(See page 71.)

FRANCO-American Auto & Supply Co., 1404-1406 Michigan Ave., Chicago, Ill.
(See page 77.)

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill.
(See page 101.)

MUTUAL Auto Accessories Co. (The), 1937 Broadway, N. Y. City.
(See page 239.)

NEUSTADT Auto & Supply Co., St. Louis, Mo.
(See page 99.)

NEW York Sporting Goods Co., 17 Warren St., New York.
(See page 205.)

POPE Mfg. Co., Hartford, Conn.
(See page 95.)

SWITCHES (Electric)

AUTO Appliance Co., 24 Mechanic St., Newark, N. J.

B. & J. Mfg. Co., 3985 Cottage Grove Ave., Chicago, Ill.

BROC-Barbier Auto Ignition Co., 143 W. 54th St., N. Y. City.

BYRNE, Kingston & Co., Kokomo, Ind.

CONNECTICUT Telephone & Electric Co., Inc., Meriden, Conn.

DAYTON Electrical Mfg. Co. (The), 87 St. Clair St., Dayton, O.
(See page 113.)

DOW Portable Electric Co. (The), Braintree, Mass.

ELDREDGE Elec. Mfg. Co., 7 Post Office Square, Springfield, Mass.

GEEN Electrical Mfg. Co., Inc., 180 E. Lake St., Chicago, Ill.

GOEBEL, F. A., Marietta, O.

HART & Hegeman Mfg. Co., 342 Capitol Ave., Hartford, Conn.

HERZ & Co., 203-205 Lafayette St., New York.

KENT Mfg. Works, Atwater, 50 North 6th St., Philadelphia, Pa.
(See page 115.)

KNOBLOCK-Heideman Mfg. Co., South Bend, Ind.

KOKOMO Electric Co., Kokomo, Ind.

McKIBBEN, Geo. N., 94 Washington St. South Norwalk, Conn.

NATIONAL Coil Co., Lansing, Mich.

PITTSFIELD Spark Coil Co., Dalton, Mass.
(See page 157.)

REMY Electric Co., Anderson, Ind.

ROBERT Instrument Co., 49 Shelby St., Detroit, Mich.
(See page 29.)

SCHUG Electric Mfg. Co., 326 Jefferson Ave., Detroit, Mich.
(See page opposite.)

SEIDLER-Miner Electric Co., 205-209 Jefferson Ave., Detroit, Mich.
(See page 33.)

SPECIALTY Mfg. Co., South Norwalk, Conn.

SPLITDORF, C. F., 261-265 Walton Ave., New York City.
(See page 115.)

TRITT Electric Co. (The), Union City, Ind.

WESTERN Electric Co., 259 So. Clinton St., Chicago, Ill.

WILLIAMS, E. Q., 531 So. Clinton St., Syracuse, N. Y.

SWITCHES (Electric, Lock)

AMERICAN Coil Co., Inc., Foxboro, Mass.

AUTO Appliance Co., 24 Mechanic St., Newark, N. J.

AUTO Lock Co., 6546 Minerva Ave., Chicago, Ill.

AUTO-Lock Plug Co., Inc., 31 Nassau St., N. Y. City.

BRANDOW Combination Lock Switch Co., 86 North St., Pittsfield, Mass.

GOEBEL, F. A., Marietta, O.

MOTOR Specialty Mfg. Co., 105 Washington St., Chicago, Ill.

PITTSFIELD Spark Coil Co., Dalton, Mass.
(See page 157.)

STANDARD Auto Supply & Mfg. Co., 20 Broad St., N. Y. City.

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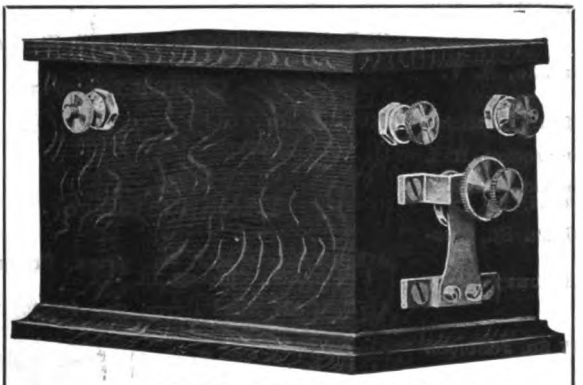
Schug Induction Spark Coils Electric Accessories Toledo Storage Battery

1907 LINE



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OUR TIMERS are Ball Bearing—made in two styles—and superior to any others on the market.

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(See page 223.)

A-Z Co. (The), 527 West 56th St., N. Y. City.

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BOWSER & Co., S. F., Ft. Wayne, Ind.
(See page opposite.)

BOYD, James, 73 39th St., Brooklyn, N. Y.

BOYER-Radford & Gordon Tank & Pump Co., Ice Ave., Dayton, Ohio.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J.
(See page 145.)

FEDDERS Mfg. Works, Buffalo, N. Y.
(See page opposite.)

FREELAND Sons Co., B. F., Sturgis, Mich.

GETCHELL, S. S., & Son, Woonsocket, R. I.

GLEASON-Peters Air Pump Co., Mercer and Houston Sts., New York, N. Y.

GRAY & Sons, Peter, 88-90 Union St., Boston, Mass.

HAYES Mfg. Co., 360-70 Maybury Ave., Detroit, Mich.
(See page 73.)

IMPERIAL Brass Mfg. Co., 247 So. Jefferson St., Chicago, Ill.

IRONCLAD Mfg. Co., 204 Varet St., Brooklyn, N. Y.

JANNEY, Steinmetz & Co., 4th and Market Sts., Philadelphia, Pa.
(See page 245.)

KELLS Mfg. Co., W. J., 60-62 Van Winkle Ave., Jersey City, N. J.

KINSEY Mfg. Co., 1126 E. 3rd St., Dayton, O.

KOVEN & Brother, L. O., 50 Cliff St., N. Y. City.

MANUFACTURERS' Can Co., 434 Mulberry St., Newark, N. J.

MULLINS Co., The W. H., 124 Franklin St., Salem, O.

MURREY & Murrey, 113 Allegan St., E., Lansing, Mich.

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OHIO Blower Co. (The), 43 Michigan St., Cleveland, O.

PRESSED Steel Tank Co., Milwaukee, Wis.

STANDARD Welding Co. (The), Cleveland, O.

TRAGESER Steam Copper Works, John, 447-457 W. 26th St., New York.

WESTERN Drop Forge Co., Marion, Ind.

WESTERN Oil Pump Co., 2447 Kosciusko St., St. Louis, Mo.

WILSON & Co., F. Cortez, 247 Lake St., Chicago, Ill.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

WRIGHT Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill.

TANKS (Acetylene)

AVERY Portable Lighting Co., 18-22 Martin St., Milwaukee, Wis.

COMMERCIAL Acetylene Co., 80 Broadway, New York City.

OLD Colony Light Co., 45 Milk St., Boston, Mass.

PREST-O-Lite Co., 1904 Broadway, New York City.
(See page 179.)

TANKS (Storage)

ACORN Brass Mfg. Co., Green, Fulton and Peoria Sts., Chicago, Ill.

AMERICAN Steel Barrel Co., 204-206 Varet St., Brooklyn, N. Y.

BOWSER & Co., S. F., Ft. Wayne, Ind.
(See page opposite.)

BOYER-Radford & Gordon Tank & Pump Co., Ice Ave., Dayton, O.

BROWN Oil Can Co., Dawson St., Toledo, O.

EASTERN Oil Tank Co., 136 Fletcher St., Lowell, Mass.
(See page 137.)

FREELAND Sons Co., B. F., Sturgis, Mich.

GETCHELL, S. S., & Son, Woonsocket, R. I.

GILBERT & Barker Mfg. Co., 82 4th Ave., N. Y. City.

GLEASON-Peters Air Pump Co., Mercer and Houston Sts., N. Y. City.

HYDRAULIC Oil Storage & Distributing Co., 820 Penobscot Bldg., Detroit, Mich.

IRONCLAD Mfg. Co., 204 Varet St., Brooklyn, N. Y.

KALTENBACH, Fred, 234 Washington Blvd., Chicago, Ill.

NATIONAL Oil Pump & Tank Co., Inc. (The), 411-13 E. 1st St., Dayton, O.

NORTMANN-Duffke Foundry Co., 26th and Layton Aves., Milwaukee, Wis.

SAFETY Tank Co., 25 W. 42d St., N. Y. City.

STOUTENBOROUGH, X., 277 Pearl St., N. Y. City.

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TOKHEIM Mfg. Co., Cedar Rapids, Iowa.

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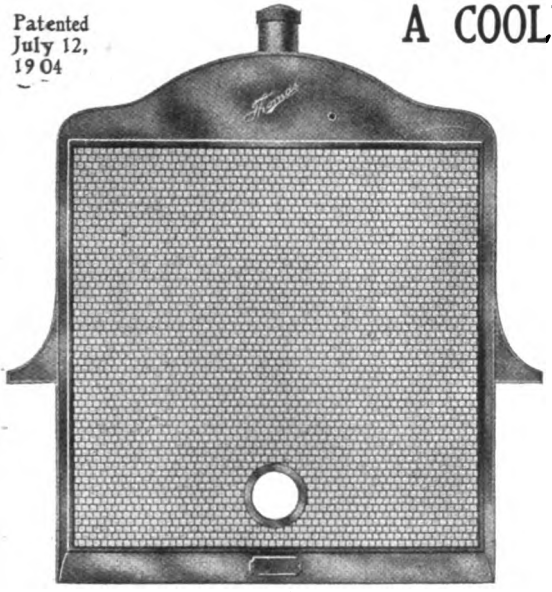

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(See Screw Machine Products)

THREAD (Top and Upholstering)

AMERICAN Thread Co., Boston, Mass.

CRANSKA Thread Co. (The), Worcester, Mass.

MEYER & Co., John C., Boylston and Bismarck Sts., Jamaica Plain, Mass.

TIMERS

(See Spark Timing Devices)

TIRE CASES

ALLEN Auto Specialty Co., 1931 Broadway, N. Y. City.

BUOB & Scheu, 408-12 E. Court St., Cincinnati, Ohio.

BROC Carriage & Wagon Co., 1665-67 40th St., N. E., Cleveland, Ohio.

BURGIN Bros., Springfield, Mass.

EMPIRE Automobile Tire Co., Trenton, N. J.

FICKLING & Co., Inc., 154 E. 57th St., N. Y. City.

GILBERT Mfg. Co., New Haven, Conn. (See page 31.)

HOPEWELL Bros., 42 Osborne St., Cambridge, Mass. (See page opposite.)

HUMPHREYS, J., 4038 Payne Ave., N. E., Cleveland, O.

INNER Shoe Tire Company, 64 Monroe St., Grand Rapids, Mich.

KIMBALL Tire Case Co., 171 Broadway, Council Bluffs, Ia.

LONDON Auto Supply Co., 1229 Michigan Ave., Chicago, Ill. (See page 189.)

NATHAN Novelty Mfg. Co., 88-90 Reade St., N. Y. City.

NEW YORK Motor Fabric Co., 32 Union Square, N. Y. City.

PNEUMATIC Tire Shield Co., Cedar Rapids, Iowa.

SEITZ, C., 207 E. 35th St., N. Y. City.

TEEL Mfg. Co., 132 Main St., Medford, Mass.

VEHICLE Apron & Hood Co., 272 N. 4th St., Columbus, Ohio.

VEHICLE Top & Supply Co., 900-02 Cass Ave., St. Louis, Mo. (See page 191.)

WILEY & Son Co., Wm. H., Hartford, Conn.

WINSHIP, W. W., 71 Summer St., Boston, Mass.

TIRE CHAINS

DEFIANCE Chain Co. (The), 143 Federal St., Boston, Mass.

GAYLOR, L. B., 43 N. Beacon St., Allston, Mass.

JOHNSON Sporting Goods Co., Iver, 163-65 Washington St., Boston, Mass.

SAGER Co., J. H., 265 South Ave., Rochester, N. Y.

SLAMA Tire Protector Co., Humboldt, Neb.

WEED Chain Tire Grip Co., 28 Moore St., N. Y. City. (See page 29.)

WILLYOUNG Appliance Co., Yonkers, N. Y. (See page 161.)

TIRE FLUID

BIKO Mfg. Co., Hubbardson, Mass.

BUFFALO Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.

CHICAGO Tire Filling Co., 122 S. Green St., Chicago, Ill.

ELASTRO Mfg. Co. (The), 26 State St., Hartford, Conn.

GUMELASTIC Tire Co. (The), 920-922 Bolivar Rd., Cleveland, O.

JACKSON Tire Filling & Refilling Co., 190 W. Jackson Blvd., Chicago, Ill.

LINOLE Mfg. Co., Santa Clara, Cal.

LONGHURST, Jr., James S., Lynbrook, L. I., N. Y.

MAINE Elastic Tire Filling Co., 9 Casco St., Portland, Me.

MOORE Co., Geo. P., 721 Golden Gate Ave., San Francisco, Cal.

NEWMASTIC Tire Co., 151 W. 68th St., N. Y. City.

NEW York Anti-Puncture Tire Co., 132 W. 49th St., N. Y. City.

TIRE HOLDERS

AMERICAN Motor Parts Co., 21-23-25 Plymouth Court, Chicago, Ill. (See page 113.)

ALLEN Auto. Specialty Co., 1931 Broadway, N. Y. City.

APPLIANCE Mfg. Co. (The), 72-86 W. Jackson Blvd., Chicago, Ill. (See page 49.)

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass. (See page 151.)

GILBERT Mfg. Co., New Haven, Conn. (See page 21.)

HARPER Co., Walter J., 229-31 Mulberry St., Newark, N. J.

HILLMAN Plating & Auto Supply Co., 446 Fremont St., Boston, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill. (See page 101.)

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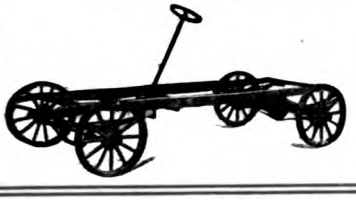
Do You Know

that any kind of auto motor can be hung in our pressed steel and angle iron frame running gears



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Get our catalog of chassis, bodies, wheels, axles, steering devices and cars ready for power.

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HOPEWELL TIRE CASE

NEW NEAT NATTY ALL COLORS SIZES

WATER STAIN GREASE DUST PROOF

ARTIFICIAL LEATHER 4.00
BLACK ENAMELED DUCK 3.00

MANUFACTURED ONLY BY

HOPEWELL BROS.

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IF YOUR DEALER DOES NOT CARRY SEND US P.O. ORDER.

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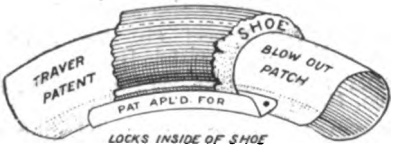
Patent Blowout Patch



Made of FABRIC and RUBBER, like an AUTO SHOE; with a brass flange that prevents it from "CREEPING."

YOU NEED NOT CARRY EXTRA SHOES if you carry Traver patches.

The **Only** road repair for a **Rim-Cut**; The **Best** in the **World** for a **Blowout**.

DON'T THROW WORN SHOES AWAY! Traver Patches Make Them Serviceable.

A **MONEY-SAVER** for the **OWNER**: A **TROUBLE-SAVER** for the **CHAUFFEUR**.

THREE SIZES:

No. 0—For shoes 3 in. or under - - - $3.50
No. 1—For shoes 3½ inches - - - - 4.00
No. 2—For shoes 4 in. or over - - - 5.00

THREE STYLES: **Clincher—Dunlop—Fisk.**

State SIZE and STYLE required.

For Sale by All Dealers, or Sent Anywhere in the United States upon receipt of price.

Traver Blowout Patch Co.

Patentees and Manufacturers

1265 Broadway NEW YORK

OUR TIRE ADJUSTERS WILL PUT ON OR TAKE OFF ANY TIRE WITHOUT EXERTION

The "Minute" clincher tire adjuster will actually take off or put on the **heaviest clincher tire in one minute** without injury to the shoe or inner tube and may be easily operated by a woman or child. The L & M ring tire adjuster is the only ring tire adjuster on the market. It consists of six tools which are slipped over the tire at intervals and by turning crank the tire is forced back from the ring all the way round, thus enabling you to put on or take off the ring with ease. **Write to-day for catalog and discount sheet.**

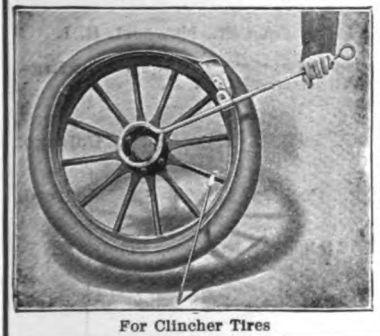
Patents applied for.

Dealers Wanted.

Large Discounts.

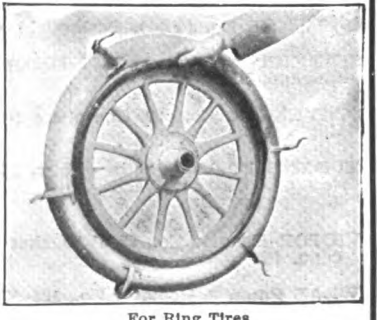
LONG & MANN CO.
527 Central Building,
Rochester, N. Y.

The "Minute" Adjuster



For Clincher Tires

The "L & M" Adjuster



For Ring Tires

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NEW JERSEY Aluminum Co., 701 Springfield Ave., Newark, N. J.
(See page 21.)

POLSON, W. F., 22 W. Utica St., Buffalo, N. Y.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich.
(See page 139.)

TIRE INFLATORS (Pump)

ARTIZAN Brass Co., 204 Lincoln Park Blvd., Chicago, Ill.

AUTO Pump Co., Springville, N. Y.

BELL, D. M., Franklin and Michigan Sts., Chicago, Ill.

BRIDGEPORT Brass Co., Bridgeport, Conn.

CLEVELAND Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

COLONIAL Brass Co. (The), 316-318 Seneca St., Cleveland, O.

EMPIRE Automobile Tire Co., Trenton, N. J.

FERODOWILL Mfg. Co., St. Paul, Minn.

HERZ & Co., 203-205 Lafayette St., New York.

IMPERIAL Brass Mfg. Co., 247 So. Jefferson St., Chicago, Ill.

JONES, Wm. S., 1303 Michigan Ave., Chicago, Ill.

JUDD & Leland Mfg Co., Clifton Springs, N. Y.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

MANHATTAN Brass Co., 328 E. 28th St., N. Y. City.

MANHATTAN Screw & Stamping Works, 67th St. and West End Ave., N. Y. City.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 11.)

MILLER Mfg. Co., Peekskill, N. Y.

NOERA Mfg. Co., Waterbury, Conn.

SHAWVER Co. (The), Springfield, O.

SKINNER & Skinner, 1337 Michigan Ave., Chicago, Ill.

STEVENS & Co., 99 Chambers St., N. Y. City (Jobbers).

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

VICTOR Electric Co., 55-61 Market St., Chicago, Ill.

WRAY Pump & Register Co., 191-93 Mill St., Rochester, N. Y.

TIRE INFLATORS (Power Driven)

GLEASON-Peters Air Pump Co., Mercer and Houston Sts., New York, N. Y.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

LIPPINCOTT Steam Specialty & Supply Co., Newark, N. J.

PACIFIC Tucking & Mfg. Co., 471-473 18th St., Brooklyn, N. Y.

ROTARY Triplex Pump Co., 126-128 South Jefferson St., Chicago, Ill.

SKINNER & Skinner, 1337 Michigan Ave., Chicago, Ill.

SPACKE Machine Co. (The), F. W., Indianapolis, Ind.
(See page 65.)

TILEY-Pratt Co. (The), Essex, Conn.

VICTOR Electric Co., 51-55 Market St., Chicago, Ill.

TIRE INFLATORS (Tank)

AVERY Portable Lighting Co., 18-22 Martin St., Milwaukee, Wis.

PREST-O-LITE Co. (The), 1904 Broadway, N. Y. City.
(See page opposite.)

STANDARD Carbonic Co. (The), Cincinnati, O.

TIRE IRONS

ADAPT Machinery Co. (The), 1624-30 Wabash Ave., Chicago, Ill.

ELLIOTT & Co., W. J., 185 Franklin St., Boston, Mass.

EMPIRE Automobile Tire Co., Trenton, N. J.

FICKLING & Co., Inc., 154 E. 57th St., N. Y. City.

JANNEY, Steinmetz & Co., 4th and Market Sts., Philadelphia, Pa.
(See page 245.)

MORGAN, B., 88 John St., Newport, R. I.

NEW Jersey Aluminum Co., 701 Springfield Ave., Newark, N. J.
(See page 21.)

ROSS, H. S., 5607 S. Halsted St., Chicago, Ill.

TEEL Mfg. Co., 132 Main St., Medford, Mass.

TRENTON Malleable Iron Co. (The), N. Y. Ave., Trenton, N. J.

UTILITY Co. (The), 332 Broadway, New York.

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Prest-O-Lite TANKS for LIGHTING and Tire Inflating

Nothing is easier for making money than the facilities we offer to agents who handle **"PREST-O-LITE" TANKS.**

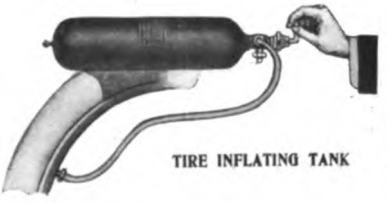
Every customer who comes into your shop is interested in the question,

PREST-O-LITE TANKS SOLVE THE PROBLEM COMPLETELY.

With the name and reputation behind **"PREST-O-LITE" TANKS,** it is one of the easiest things to supply the demand already created.

TO OFFER THEM IS TO SELL THEM.

Write TO-DAY for particulars.



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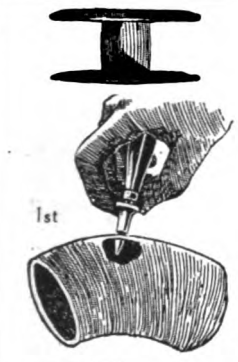
THE PREST-O-LITE CO.

1904 Broadway. NEW YORK.

MAIN STATIONS } NEW YORK, 1904 Broadway. BOSTON, 541 Tremont. SAN FRANCISCO, Point Richmond INDIANAPOLIS, 22-24 S. East Street TORONTO, 6 King Street, W.

Or at Any Responsible Dealers or Garage

A "CINCH" FOR BIG PROFITS WITH THE QUICK SELLING "CINCH" TIRE REPAIR KIT



EVERY AUTOIST WANTS IT

Because it Repairs a Puncture in ONE Minute and **REPAIRS IT PERMANENTLY**

NO CEMENT—NO VULCANIZING—NO WAITING

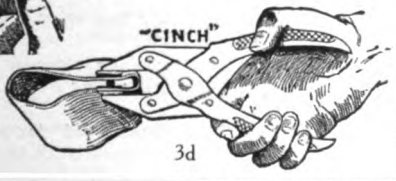
SAVES TIME — MONEY — TEMPER

The secret lies in the Collapsible Metal Seal, Rubber Coated, which is so easily and quickly handled.

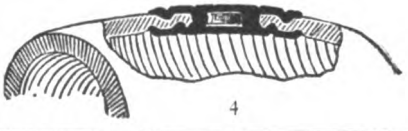
WE WANT DEALERS EVERYWHERE AND MAKE LIBERAL DISCOUNTS TO GET THEM

Auto Goods Co.

65 State St., Boston Mass.



Write for Proposition



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TIRE PATCHES

BUFFALO Rubber Mfg. Co., Sussex Ave. and Erie Ry., Buffalo, N. Y.

CONTINENTAL Rubber Works, Erie, Pa.

DIAMOND Rubber Co., Akron, O.
(See page 183.)

EMPIRE Automobile Tire Co., Trenton, N. J.

ENTERPRISE Rubber Co., 110 Federal St., Boston, Mass.

HARTFORD Rubber Works Co., Hartford, Conn.
(See page 185.)

HEALY Leather Tire Co., 90 Gold St., N. Y. City.
(See page opposite.)

INNER Shoe Tire Co., 64 Moore St., Grand Rapids, Mich.

MORGAN & Wright, Detroit, Mich.
(See page 229.)

M. & M. Manufacturing Co. (The), Akron, O.

PARKER, Stearns & Co., 228 South St., N. Y. City.
(See page 205.)

TINGLEY & Co., Chas. O., Rahway, N. J.

TRAVER Blow-out Patch Co., 1265 Broadway, N. Y. City.
(See page 177.)

TRENTON Rubber Mfg. Co., Trenton, N. J.
(See page opposite.)

TIRE PLUGS

APSTEIN, D., Bridgeport, Conn.

DIAMOND Rubber Co., Akron, O.
(See page 183.)

HARTFORD Rubber Works Co., Hartford, Conn.
(See page 185.)

ENTERPRISE Rubber Co., 110 Federal St., Boston, Mass.

GOODRICH, B. F., Co., Akron, O.

HUNTINGTON Automobile Co., Huntington, L. I., N. Y.
(See page 9.)

TINGLEY & Co., Chas. O., Rahway, N. J.

TIRE REPAIR KITS

AUTO Goods Co., 65 State St., Boston, Mass.
(See page 179.)

CHANNON & Co., H., Market and Randolph Sts., Chicago, Ill.

DIAMOND Rubber Co., Akron, O.
(See page 183.)

EMPIRE Automobile Tire Co., Trenton, N. J.

GOODRICH, B. F., Co., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

HARTFORD Rubber Works Co., Hartford, Conn.
(See page 185.)

INDEPENDENT Tire & Rubber Co., Akron, O.

INNER Shoe Tire Co., 64 Monroe St., Grand Rapids, Mich.

MORGAN & Wright, Detroit, Mich.
(See page 229.)

M. & M. Manufacturing Co. (The), Akron, O.

RHODES Mfg. Co., Lane Ave. and Sibley St., Grand Rapids, Mich.

TIRE SHOES

AKRON Pneumatic Tire & Protector Co., Akron, O.

GRINARD Inserted Leather Auto Shoe Co., Buffalo, N. Y.
(See page 227.)

INNER Shoe Tire Co., 64 Monroe St., Grand Rapids, Mich.

MANNING Mfg. Co., Holyoke, Mass.

VEHICLE Apron & Hood Co., 272 N. 4th St., Columbus, O.

WINSHIP, W. W., 71 Summer St., Boston, Mass.

TIRE SLEEVES

ADWEAR Auto Tire Sleeve Co., High and Washington Sts., North Attleboro, Mass.

AKRON Pneumatic Tire & Protector Co., Akron, O.

AMERICAN Anti-Puncture Tire & Auto Co., 1693 Broadway, N. Y. City.

CHICAGO Rawhide Mfg. Co., 75-77 Ohio St., Chicago, Ill.

HEALY Leather Tire Co., 90 Gold St., N. Y. City.
(See page opposite.)

HOWARD Mfg. Co., Attleboro, Mass.

INNER Shoe Tire Co., 64 Moore St., Grand Rapids, Mich.

KIMBALL Tire Case Co., Council Bluffs, Ia.

MESINGER Mfg. Co., H. & F., 1801 First Ave., N. Y. City.

PNEUMATIC Tire Protector Co., 14-16 S. St. Clair St., Dayton, O.

TRAVER Blow-out Patch Co., 1265 Broadway, N. Y. City
(See page 177.)

VEHICLE Apron & Hood Co., Columbus, O.

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HEALY LEATHER TIRES

DO NOT Puncture, Skid, Rim-Cut, Blow Out

HEALY INNER TUBES

Made of tough, heavy red rubber Will not deteriorate in Three Years

PUNCTURES REPAIRED FREE OF CHARGE FOR ONE YEAR

HEALY DETACHABLE TIRE GRIPS

Prevents Skidding Does not injure the Tire

Wears longer than any other Grip Quiet running

Easily attached

HEALY LEATHER TIRE COMPANY

1906 Broadway - 90 Gold Street New York

Branches: 1251 Michigan Avenue, Chicago
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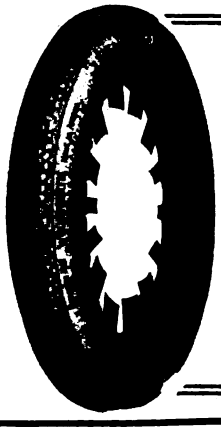
344 Cumberland Street, Brooklyn



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DETACHABLE TREAD ADJUSTABLE

"SAVES MORE THAN HALF THE TIRE BILL"!

Absolutely Essential to the Economical Running of an Automobile. Shields the Tire against the Dangers of Rough Roads, Hard Usage, Blisters, Bulges, Blow-outs, and against Cuts, Penetrating Moisture and Consequent Rotting of the Fabric. **Prevents Punctures.** Makes the **New** Tire Last Three Times Longer and Adds Many Miles to the Life of the **old.** Bears the Brunt of Wear, Takes Sure Grip on Smooth or Slippery Roads and **Makes Skidding Impossible. Saves More Than Half the Tire Bill. Positively Does Not Heat the Tire,** but on the Contrary Keeps it Cooler. One style fits all makes of tires. Easy to attach, easy to adjust. Anybody can do it. Our free booklet will tell you all about it. Sizes 26 x 2½ inches to 36 x 5 inches. Prices $8 to $25 each.

LEATHER TIRE GOODS CO., NEWTON UPPER FALLS, MASS.
New York Store, 1662 Broadway

AUTO INNER TUBES

GRAY OR RED

FROM EVERY STANDPOINT THE BEST TUBE MADE.

Many satisfied users testify to many miles run—5,000 to 10,000 without reinflating or trouble of any kind.

RETREADING STOCKS AND FRICTION FABRICS.

Cements and Auto Matting. Consult us. Get Prices and Samples.

TRENTON RUBBER MFG. CO., Trenton, N. J., U.S.A.

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TIRE STRAPS

LEATHER Tire Goods Co., Newton Upper Falls, Mass.
(See page 181.)

TIRE TAPE

BOSTON Woven Hose & Rubber Co., 29 Hampshire St., Cambridge, Mass.

GOODYEAR Tire & Rubber Co., Akron, O.

MASSACHUSETTS Chemical Co., Walpole, Mass.

NATIONAL Cement & Rubber Mfg. Co., 3053 Monroe St., Toledo, O.

NATIONAL India Rubber Co., Bristol, R. I.

TIRE TOOLS

AUTO Improvement Co., 316 Hudson St., New York City.

BLANCHARD, A. W., 10 Clinton St., Brooklyn, N. Y.

GOODRICH, B. F., Co., Akron, O.

HANCOCK & Heller, 455 O'Neil Bldg., Binghamton, N. Y.

KONIGSLOW Mfg. Co., Otto, Cleveland, O.
(See page 49.)

LONG & MANN Co. (The), 527 Central Bldg., Rochester, N. Y.
(See page 177.)

MAXWELL & Co., L. R., Cedar Rapids, Ia.

MORGAN & Wright, Detroit, Mich.
(See page 229.)

NOONAN Tool & Machine Works, 105 E. Dow St., Rome, N. Y.

POLSON, W. F., 22 West Utica St., Buffalo, N. Y.

RHODES Mfg. Co., Lane Ave. and Sibley St., Grand Rapids, Mich.

SHAWVER Co. (The), Springfield, O.

UNITED States Jack Co., 128-30 W. Lake St., Chicago, Ill.

TIRE TREADS

ADWEAR Auto Tire Sleeve Co., High and Washington Sts., North Attleboro, Mass.

AKRON Pneumatic Tire & Protector Co., Akron, O.

AMERICAN Tire Co., Owasso, Mich.

BAILEY & Co., C. J., 22 Boylston St., Boston, Mass.

BOSTON Tire Tread Co., 45 Stanhope St., Boston, Mass.

BUFFALO Rubber Mfg. Co., Sussex Ave. and Erie R. R., Buffalo, N. Y.

HEALY Leather Tire Co., 90 Gold St., N. Y. City.
(See page 181.)

INVINCIBLE Tire Armor Co., Hartley, Ia.

KIMBALL Tire Case Co., 171 Broadway, Council Bluffs, Ia.

LEATHER Tire Goods Co., Newton Upper Falls, Mass.
(See page 181.)

M. & M. Manufacturing Co. (The), Akron, O.

MAPLEBAY Mfg. Co., Crookston, Minn.

PERFECT Tire Co., Rock Rapids, Ia.

REPUBLIC Rubber Tire & Shoe Co. (The), 449 W. 53d St., N. Y. City.

SAMSON Leather Tire Co., 1634-1642 Broadway, N. Y. City.
(See page opposite.)

S. C. Fabric Tire Tread Co., 1900 Broadway, New York.

SLAMA Tire Protector Co., Humboldt, Neb.

TIRE TUBES (Inner)

BUFFALO Rubber Mfg. Co., Sussex Ave. and Erie R. R., Buffalo, N. Y.

CONTINENTAL Rubber Wks., Erie, Pa.

ELECTRIC Rubber Mfg. Co., Rutherford, N. J.

EMPIRE Automobile Tire Co., Trenton, N. J.

HEALY Leather Tire Co., 90 Gold St., N. Y. City.
(See page 181.)

MARTIN-Evans Co., 1186 Bedford Ave., Brooklyn, N. Y.

MORGAN & Wright, Detroit, Mich.
(See page 229.)

PARKER, Stearns & Co., 228-229 South St., N. Y. City.
(See page 205.)

TRENTON Rubber Mfg. Co., Trenton, N. J.
(See page 181.)

VICTOR Auto Tire Repair Co. (The), 220 Madison St., Passaic, N. J.

TIRES (Cellular)

BROOKE Airless Tire Co., 1422 Grant Ave., Denver, Colo.

RUBBER Tire Co. (The), 1215 Arch St., Philadelphia, Pa.

VOORHEES Rubber Mfg. Co., 18 Bostwick Ave., Jersey City, N. J.

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Boston swelled the list of pleasure cars exhibited in this season's shows to A GRAND TOTAL OF 1788.

Over 33 per cent. of all—a total of 591 cars, were equipped with

Diamond

WRAPPED TREAD TIRES

The next highest three makes of tires *combined* equipped but 574 cars.

The year's results will confirm the judgment the leading automobile manufacturers have thus expressed.

Let us send you our 1907 "Instruction Book Catalogue."

THE DIAMOND RUBBER COMPANY, Akron, Ohio.

SAMSON

TYPE COURSE

NON SKIDDING NON PUNCTURABLE

KING OF TIRES
TIRE OF KINGS

SAMSON LEATHER TIRE CO.,
1634-1642 Broadway, New York.
G. de PONTAC, Gen'l Manager.

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TIRES (Cushion)

ARCHER Auto Tire Co. (The), 548 W. Center St., Marion, Ohio.

MOTZ Clincher Tire & Rubber Co. (The), Akron, Ohio.

PUNCTUREPROOF Tire Co. (The), 322 Euclid Ave., Cleveland, O.

ST. JOHN Rubber Tire Co., Inc., 116 Broad St., N. Y. City.

TIRES (Leather)

AMERICAN Tire Co., Owosso, Mich.

CENTRAL Leather & Rubber Tire Works, 238-240 W. 50th St., N. Y. City.

HEALY Leather Tire Co., 90 Gold St., St., New York.
(See page 187.)

MESINGER Mfg. Co., H. & F., 1801 First Ave., N. Y. City.

SAMSON Leather Tire Co., 1634-1642 Broadway, N. Y. City.
(See page 183.)

TIRES (Pneumatic)

AJAX-Grieb Rubber Co., Trenton, N. J.

COMMONWEALTH Rubber Co., Reading, Mass.

CONTINENTAL Caoutchouc Co., 43 Warren St., N. Y. City.
(See page 225.)

DIAMOND Rubber Co., Akron, O.
(See page 183.)

EMPIRE Automobile Tire Co., Trenton, N. J.

FIRESTONE Tire & Rubber Co., Miller St. and Sweitzer Ave., Akron, Ohio.

FISK Rubber Co., Chicopee Falls, Mass.

G & J Tire Co., 549 E. Georgia St., Indianapolis, Ind.
(See page 155.)

GAULIOS Tire Co., Broadway and 56th St., N. Y. City.

GOODRICH, B. F., Co., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

GOSHEN Rubber Works, Goshen, Ind.

HARBURG Tire Co., 234 W. 58th St., N. Y. City.
(See page 227.)

HARTFORD Rubber Works Co., Hartford, Conn.
(See page opposite.)

INDEPENDENT Tire & Rubber Co., Akron, O.

KOKOMO Rubber Co., Kokomo, Ind.

MORGAN & Wright, Detroit, Mich.
(See page 229.)

PENNSYLVANIA Rubber Co., Jeannette, Pa.

REPUBLIC Rubber Co. (The), Youngstown, Ohio.

SAMSON Leather Tire Co., 1634-42 Broadway, N. Y. City.
(See page 183.)

SHAWMUT Tire Co., 97 Bedford St., Bedford, Mass.

SWINEHART Clincher Tire & Rubber Co., Akron, O.
(See page 225.)

TRACTION Tread Tire & Tube Co., 1695 Broadway, N. Y. City.

TRIDENT Tire Co., 1593 Broadway, N. Y. City.

TIRES (Solid)

BATAVIA Rubber Tire Co., Batavia, N. Y.

CONSOLIDATED Rubber Tire Co., 40 Wall St., N. Y. City.

DIAMOND Rubber Co., Akron, O.
(See page 183.)

FIRESTONE Tire & Rubber Co., Miller St. and Sweitzer Ave., Akron, O.

GOODRICH, B. F., Co., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

HARTFORD Rubber Works Co., Hartford, Conn.
(See page opposite.)

KOKOMO Rubber Co., Kokomo, Ind.

MAHONING Rubber Co., Youngstown, O.

MORGAN & Wright, Detroit, Mich.
(See page 229.)

MOTZ Clincher Tire & Rubber Co. (The), Akron, Ohio.

NEW YORK Belting & Packing Co., 25 Park Place, N. Y. City.

ONEIDA Rubber Tire Works, Oneida, N. Y.

PENNSYLVANIA Rubber Co., Jeannette, Pa.

REPUBLIC Rubber Co. (The), Youngstown, Ohio.

STEIN Double Cushion Tire Co., Akron, O.

SWEET Tire & Rubber Co. (The), Batavia, N. Y.

SWINEHART Clincher Tire & Rubber Co., Akron, O.
(See page 225.)

TOOLS

ARMSTRONG Bros. Tool Co., 104-124 N. Francisco Ave., Chicago, Ill.

ATHA Tool Co. (The), Newark, N. J.

AUTMO Cabinet Co. (The), Cox Bldg., Rochester, N. Y.

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NEW YORK, 88 Chambers St. and 1769 Broadway — CHICAGO, 83 Michigan Ave. — BOSTON, 494 Atlantic Ave., and 1020 Boylston St.

PHILADELPHIA, 138 North 10th St. — BUFFALO, 725 Main St. — CLEVELAND, 1831 Euclid Ave.

DETROIT, 256 Jefferson Ave. — DENVER, 1564 Broadway — LOS ANGELES, 1505 South Main St. — SAN FRANCISCO, 423-433 Golden Gate Ave.

AGENCIES: Pittsburg Rubber Co., 913-915 Liberty Ave., Pittsburg; Gugler Electric Mfg. Co., Minneapolis; Mercantile Lumber and Supply Co., Kansas City; F. P. Keenan Co., Portland (Ore.); Salt Lake Hardware Co., Salt Lake City; Charles L. Seeger (Compania Mexicana de Vehiculos Electricos), City of Mexico; Geo. W. Perry Co., 9th and Lucas Ave., St. Louis, Mo.

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BILLINGS & Spencer Co. (The), Russ and Lawrence Sts., Hartford, Conn.

BOWN Machine Co., Ltd., Battle Creek, Mich.

BRIDGEPORT Hardware Mfg. Co., 461-569 Iraniston Ave., Bridgeport, Conn.

BURNHAM, Geo. Co. (The), Worcester, Mass.

CHICAGO Pneumatic Tool Co., 1010 Fisher Bldg., Chicago, Ill.

DANIELSON & Co., J. S., Jamestown, N. Y.

FRASSE Co. (The), 38 Cortlandt St., N. Y. City.

FRASSE & Co., Peter A., 94 Fulton St., N. Y. City

GOODELL-Pratt Co., Greenfield, Mass.

HALL Co., Chas. E., 108 Broadway, Buffalo, N. Y.
(See page 167.)

HAMMACHER, Schlemmer & Co., 133 4th Ave., N. Y. City.

HJORTH Wrench Co., Jamestown, N. Y.

KILBORN & Bishop Co. (The), 81 Lloyd St., New Haven, Conn.

KONIGSLOW Mfg. Co., Otto, Cleveland, O.
(See page 49.)

NOONAN Tool & Machine Works, 105 E. Dow St., Rome, N. Y.

NORTON & Jones Machine Tool Works (The), East Main St., Plainville, Conn.

PATTERSON, Gottfried & Hunter, Ltd., 146-150 Centre St., New York.

REPUBLIC Belting & Supply Co. (The), Cleveland, O.
(See page 75.)

ROTHENBUCHER, Geo. E. R., 102 Hinsdale St., Brooklyn, N. Y.
(See page 211.)

SMITH & Heminway, 296 Broadway, New York.

STANDARD Tool Co., 6900-7000 Central Ave., S. E., Cleveland, O.

TOWER & Lyon Co., 95 Chambers St., New York, N. Y.

UNIVERSAL Tool Co., 54 Taylor St., Springfield, Mass.

UTICA Drop Forge & Tool Co., 296 Broadway, New York, N. Y.

VANDERBEEK Tool Works, Hartford, Conn.

WATERBURY Tool Co., Waterbury, Conn.

TOOL BAGS

BOYLE & Co., John, 112-114 Duane St., N. Y. City.

FICKLING & Co., Inc., 154 E. 57th St., N. Y. City.

GILBERT Mfg. Co., New Haven, Conn.
(See page 31.)

PATTERSON, Gottfried & Hunter, Ltd., 146-150 Centre St., New York City.

REPUBLIC Belting and Supply Co. (The), Cleveland, O.
(See page 75.)

VEHICLE Apron & Hood Co., 272 N. 4th St., Columbus, O.

WARNER Pole & Top Co., 1643 Central Ave., Cincinnati, O.

TOP-CLOTH

(See Rubber Cloth) also Trimmings (Cloth and Carpet)

TOP FIXTURES

AMESBURY Brass & Foundry Co., Amesbury, Mass.
(See page opposite.)

BLAKESLEE Forging Co., Plantsville, Conn.

BROWN & Co., S. N., 107-111 Commercial St., Dayton, O.
(See page 45.)

BROWN & Co., S. N., 107-111 Commercial St., Dayton, O.

COOPS Co., C. W., 3 Appleton St., Boston, Mass.

CORTLAND Forging Co., Cortland, N. Y.
(See page 45.)

CRANDALL, Stone & Co., Binghamton, N. Y.

DRUEN, B. D., 71 Hamilton St., New Haven, Conn.

ENGLISH & Mersick Co. (The), 70-74 Crown St., New Haven, Conn.

EVANS Mfg. Co., 118 W. Brookline St., Boston, Mass.

FICKLING & Co., Inc., 154 E. 57th St., New York.

GLOBE Brass Works, 13-15 Malcomb St., Detroit, Mich.

HARPER Co., Walter J., 229-231 Mulberry St., Newark, N. J.

METAL Stamping Co., 243 West St., New York City.

MURPHY Co., The G. W. J., Merrimac, Mass.

NON-CORROSIVE Metal Co., Inc., Watertown, Mass.

PARRY & Co., A. N., Amesbury, Mass.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SCHERER & Co., H., 280 Jefferson Ave., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich.
(See page 139.)

SPRINGFIELD Auto Top & Upholstering Co., 102-06 Dwight St., Springfield, Mass.
(See page 189.)

WING Co., Charles, Amesbury, Mass.

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ABRESCH Co., Charles, 4th and Poplar Sts., Milwaukee, Wis.

AMERICAN Top Co., Jackson, Mich.

ANDERSON & Co., F. W., 729 So. Broad St., Philadelphia, Pa.
(See page opposite.)

AUTOMOBILE Equipement Co., 264 Jefferson Ave., Detroit, Mich.
(See page 191.)

AUTO Top Co., 209 E. Columbia St., Fort Wayne, Ind.
(See page 235.)

AUTOMOBILE Buggy Top Co. of America, Noxen, Pa.

AUTO Cape Top Co., 1465 Michigan Ave., Chicago, Ill.

AUTO Equipment Co., 1424-6 Michigan Ave., Chicago, Ill.

MODERN Autotop & Equipment Co., 1375 Ontario St., Cleveland, O.

BALTIMORE Buggy Top Co., Baltimore, Md.

BARNDT-Johnston Auto Supply Co. (The), 422 Donaldson St., Columbus, O.
(See page 39.)

BAUER Bros., 937 W. 8th St., Cincinnati, O.

BEEBE, A. M., 441 Elm St., New Haven, Conn.

BLASIER Mfg. Co., M. E., 63 Columbia St., Utica, N. Y.
(See page 193.)

BLISS, Chas. P., Denver, Colo.

BLUE Ribbon Horse & Carriage Co., 130-170 Cannon St., Bridgeport, Conn.

BRIDGEPORT Vehicle Co., South Ave. and Main St., Bridgeport, Conn.

BRIGGS Carriage Co., Amesbury, Mass.

BROC Carriage & Wagon Co., 1665-67 40th St., N. E., Cleveland, O.

BROWN Auto Top Co., Philadelphia, Pa.

BUOB & Scheu, 408-412 Court St., Cincinnati, O.

CAPITOL Auto Co., 130-32 E. New York St., Indianapolis, Ind.

CHICAGO Carriage & Trimming Co., 1908 Indiana Ave., Chicago, Ill.

CHICAGO Coach & Carriage Co., 1223 Michigan Ave., Chicago, Ill.

CLEVELAND Hardware Co., E. 45th St. and Lakeside Ave., Cleveland, O.

COLLINS & Son, G. A., Akron, O.

COLLINSON, M., 1253 Michigan Ave., Chicago, Ill.

CRAY Bros., 1244 Ninth St., N. W., Cleveland, O.

CRESCENT Auto Top Co., 58 W. 43d St., N. Y. City.

CURTAIN Supply Co. (The), 85-93 Ohio St., Chicago, Ill.

DENNISTON, E. E., 184 W. Mohawk St., Buffalo, N. Y.

DETROIT Auto Top Co., Detroit, Mich.

DETROIT Motor Car Supply Co., 1250 Jefferson Ave., Detroit, Mich.

DUANE & Co., W. J., 304 W. 54th St., N. Y. City.

DUNHAM & Son, D. B., Rahway, N. J.

EMPIRE Gear & Top Co., 207 N. 22d St., Philadelphia, Pa.

EVERETT, B. F., 65 E. Fort St., Detroit, Mich.

FELLWOCK Automobile & Mfg. Co. (The), 320 Upper 4th St., Evansville, Ind.

FICKLING & Co., Inc., 154 E. 57th St., New York City.

FISHER, A., 302-310 Fort St., W., Detroit, Mich.

FITZ-GIBBON & Crisp Carriage & Auto Body Co., 28-36 Bank St., Trenton, N. J.

FLURKEY Carriage & Trimming Co., 566 Wabash Ave., Chicago, Ill.

GRAVES & Congdon Co., Oak St., Amesbury, Mass.

HARDWARE Specialty Mfg. Co., 724 W. 8th St., Anderson, Ind.

HARTFORD Auto Body Works, 809 Asylum Ave., Hartford, Conn.

HILL Manufacturing Co., 25-27 Fuller St., Buffalo, N. Y.

HOLCOMBE Co. (The), 105 Goffe St., New Haven, Conn.

HOLMES Bros., Detroit, Mich.

HUME Carriage Co., Amesbury, Mass.
(See page 147.)

INDIANAPOLIS Buggy Top Co., 2116 So. Meridian St., Indianapolis, Ind.

INDIANAPOLIS Dash Co., Indianapolis, Ind.

JOHNSON & Holmes, 1446 Wabash Ave., Chicago, Ill.

KARBACH Automobile & Vehicle Co., Omaha, Neb.

KEYSTONE Wagon Works, Reading, Pa.

KIMBALL & Co., C. P., 315 Michigan Ave., Chicago, Ill.
(See page 191.)

KING Top Mfg. Co. (The), 16 St. Clair St., Dayton, O.

KRAMER & Co., Wm. F., Canal St., Dayton, Ohio.

KROH Mfg. Co., The C. Z., Toledo, O.

LARRIMORE Buggy Top Co., Baltimore, Md.

LIMOUSINE & Carriage Mfg. Co., 35th St. and Michigan Ave., Chicago, Ill.

LONDON Auto Supply Co. (The), 1229 Michigan Ave., Chicago, Ill.
(See page opposite.)

LONGDIN-Brugger Co., Fond-du-Lac., Wis.

LOUD, Fred A., Merrimac, Mass.

MANHATTAN Auto Top Co., 249 West 64th St., New York.

MASON, John A., 312-16 Washington St., Newton, Mass.

McCLELLAN, Chas. P., Fall River, Mass.

MECKEL, F. L., 77 E. 13th St., Chicago, Ill.

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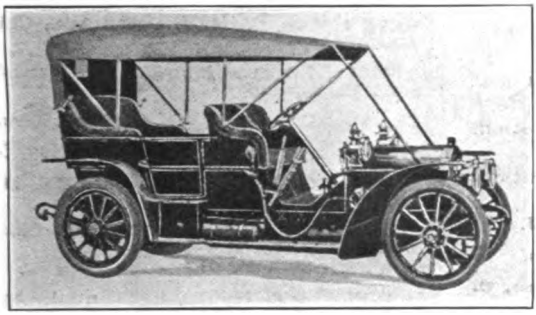

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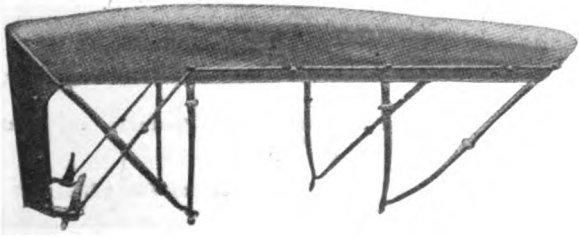

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MOTOR Top Co. of N. Y., 216 W. 50th St., N. Y. City.

MOUNT & Bros. J. W., Red Bank, N. J.

MURRAY & Co., P. A., Newton, Mass.

MYERS Auto Top Co. (The), Dayton, O. (See page 189.)

NEUMEISTER, Fred P., Rockford, Ill.

NEWTON & Son, W. H., 127 Elm St., Cortland, N. Y.

NEW York Carriage Top Co., 509 W. 30th St., N. Y. City.

NICHOLS & Co., D. P., 116-122 W. Brookline St., Boston, Mass.

NOLAN, Wm., 541 Tremont St., Boston, Mass.

PARIS Auto Top Co., 236 W. 41st St., New York.

PARSONS Buggy Top Co., 70 W. Jackson Blvd., Chicago, Ill.

PEASE & Sons, S. C., Merrimac, Mass.

PETZELT & Keyser, 24th and Locust Sts., Philadelphia, Pa.

QUINBY Co., J. M., 21-39 Division St., Newark, N. J.

RACINE Novelty Mfg. Co., 15th and Clark Sts., Racine, Wis.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

RITTER Mfg. Co., 243 Jefferson Ave., Detroit, Mich.

ROBBINS & Co., Irvin, 32 E. Georgia St., Indianapolis, Ind.

ROBERTSON & Doll, Denver, Colo.

RUSSELL, H. J., 32 Exchange St., Worcester, Mass.

SAFETY Buggy Co., Lancaster, Pa.

ST. LOUIS Buggy Top Co., 2117-19 North 9th St., St. Louis, Mo.

SCHUBERT Bros. Gear Co., 42-44 Cedar St., Oneida, N. Y.

SHAFFER Carriage Co., 938 N. Illinois St., Indianapolis, Ind.

SHELTER Top Co., 1240 North First St., St. Louis, Mo.

SHIELDS Carriage Co. (The), Amesbury, Mass.

SNOW & Co., N. H., Binghamton, N. Y.

SPRAGUE Umbrella Co. (The), Norwalk, O. (See page 247.)

SPRINGFIELD Auto Top & Upholstering Co., 102-06 Dwight St., Springfield, Mass. (See page 189.)

SPRINGFIELD Metal Body Co., 387 Birnie Ave., Brightwood, Mass. (See page 235.)

STEWART & Co., Hugh, 414 Main St., Cambridgeport, Mass.

STONE & Sons, C., 167-77 Ogden Ave., Chicago, Ill.

STUDEBAKER Bros. Mfg. Co., 378 Wabash Ave., Chicago, Ill.

TEEL Mfg. Co., 132 Main St., Medford, Mass.

TROY Carriage Sunshade Co. (The), Troy, O.

UNITED STATES Dash & Fender Co., 147 E. 42d Street, N. Y. City.

VEHICLE Top & Supply Co., 902 Cass Ave., St. Louis, Mo. (See page opposite.)

WARNER Pole & Top Co., 1648 Central Ave., Cincinnati, O.

WAUGH & Co., Chas., 856-864 Main St., Cambridge, Mass.

WAYMAN & Murphy, 257 W. Randolph St., Chicago, Ill.

WEISS & Son, Chas., 4725 Cottage Grove Ave., Chicago, Ill.

WOOD & Son, Fred'k R., 219 W. 19th St., N. Y. City.

TRIMMINGS (Cloth and Carpet)

ADAMS, Wm. F., 339 B'way, N. Y. City.

BRIDGEPORT Coach Lace Co., 805 Wood Ave., Bridgeport, Conn.

CARR, F. S., 74 Pearl St., Boston, Mass. (See page 149.)

CHANDLER Oil Cloth & Buckram Co., East Taunton, Mass.

CHASE & Co., L. C., New York, Chicago and Boston. (See page 187.)

DUSENBURY, Louis, 86-88 Worth St., N. Y. City.

EVERETT, B. F., 65 E. Fort St., Detroit, Mich.

FICKLING & Co. Inc., 154 E. 57th St., N. Y. City.

GERHAB, Jacob, 158-164 No. 3d St., Philadelphia, Pa.

HALLIDAY, C. A., 42 Cedar St., Oneida, N. Y.

HODGMAN Rubber Co., 806 Broadway, N. Y. City.

HORSTMAN Co., Wm. H., 5th and Cherry Sts., Philadelphia, Pa.

HUTCHINSON, W. R., & Co., 15 Caledonia Ave., Rochester, N. Y.

KROH Mfg Co., The C. Z., Toledo, O.

LAIDLAW, Jr., Wm. R., 1771 Broadway, N. Y. City.

LANDERS Bros. Co., Toledo, O., and Boston, Mass. (See page 149.)

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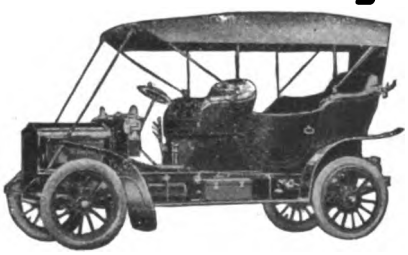

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MONARCH Rubber Co., 41 N. 7th St., Philadelphia, Pa.

MUTTY CO., L. J., 28 Summer St., Boston, Mass.
(See page 149.)

NATIONAL India Rubber Co., Bristol, R. I.

NEW Haven Button Co., New Haven, Conn.

PANTASOTE Co. (The), 11 Broadway, N. Y. City.
(See page 107.)

RARITAN Woolen Mills, 14 White St., N. Y. City.

ROEHM & Davison, Ltd., Woodbridge & Wayne Sts., Detroit, Mich.

ROY & Co., James, Watervliet, N. Y.

SCHOFIELD, Mason & Co., Fairhill and Cumberland Sts., Philadelphia, Pa.

SLATER, S., & Sons, 47 Worth St., N. Y. City.

ST. LOUIS Buggy Top Co., 2117 N. 9th St., St. Louis, Mo.

TIEL & Co., Geo., 413 Arch St., Philadelphia, Pa.

TINGUE Mfg. Co., Seymour, Conn.

VOGT Mfg. & Coach Lace Co., 332-334 St. Paul St., Rochester, N. Y.

WATERLOO Woolen Mfg. Co., Waterloo, N. Y.

TRIMMINGS (Leather)

(See Leather)

TRIMMINGS (Metal)

AMERICAN Auto Brass Co. (The), 181 West Maple St., Columbus, O.

AMESBURY Brass & Foundry Co., Amesbury, Mass.
(See page 187.)

ANDERSON & Co., F. W., 729 So. Broad St., Philadelphia, Pa.
(See page 189.)

ATWOOD Mfg. Co., Amesbury, Mass.

BARLOW Mfg. Co., Holyoke, Mass.

BLAKESLEE Forging Co., Plantsville, Conn.

CLARK Novelty Co. (The), 380 Exchange St., Rochester, N. Y.

COLUMBUS Bolt Works, 162 W. Randolph St., Columbus, O.

COOPS Co., C. W., 3 Appleton St., Boston, Mass.

CORTLAND Carriage Goods Co., Cortland, N. Y.

CORTLAND Forging Co., Cortland, N. Y.
(See page 45.)

COWLES & Co., C., Water and Chestnut Sts., New Haven, Conn.

DOUGLAS & Lomason Co., 306 Grand River Ave., Detroit, Mich.

ENGLISH & Mersick Co. (The), 70-74 Crown St., New Haven, Conn.

GLOBE Brass Works, 13-19 Malcomb St., Detroit, Mich.

HARPER Co., Walter J., 229-231 Mulberry St., Newark, N. J.

IMPERIAL Brass Mfg. Co., 247 S. Jefferson St., Chicago, Ill.

KELLEY, Maus & Co., 1-5 W. Lake St., Chicago, Ill.

LEE Mfg. Co. (The), Port Huron, Mich.

METAL Stamping Co., 243 West St., N. Y. City.

MURDOCK, Jr., Co., Jas., 116 Opera Pl., Cincinnati, O.

MURPHY Co., The G. W. J., Merrimac, Mass.

NEIDER Co., The F. A., Augusta, Ky.
(See page 187.)

NON-CORROSIVE Metal Co., Inc., Watertown, Mass.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

ROEHM & Davison, Ltd., Woodbridge and Wayne Sts., Detroit, Mich.

SCHERER & Co., H., 280 Jefferson Ave., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 Fourth St., Detroit, Mich.
(See page 139.)

TAYLOR Co., H. D., 101-105 Oak St., Buffalo, N. Y.

TURNER Brass Works (The), 72 Michigan St., Chicago, Ill.
(See page 83.)

VICTOR Metals Co., 29 Broadway, N. Y. City.

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

WING Co., Charles, Amesbury, Mass.

TRUNKS (Auto)

BAILIE Basket Co., 85-87 Hudson St., Boston, Mass.

BOYLE & Co., John, 112-114 Duane St., N. Y. City.

FULLER Company, G. W., 182-184 Asylum St., Hartford, Conn.

HASKELL Bros., Washington and Wabash Aves., Chicago, Ill.

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NOLAN, Wm., 541 Tremont St., Boston, Mass.

SAGE'S Trunk Depot, Boston, Mass.

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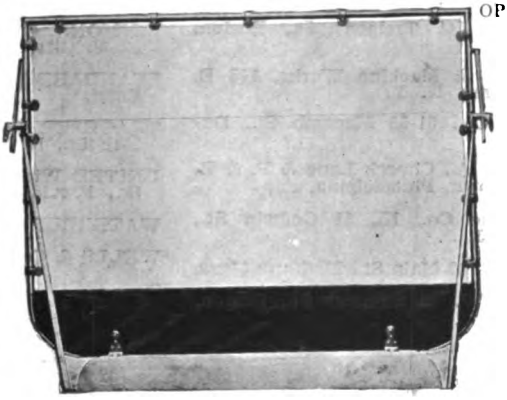

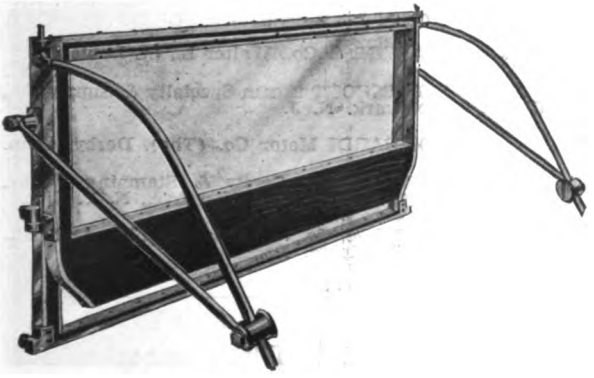

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HART Mfg. Co., 370 Atlantic Ave., Boston, Mass.

MASON, John A., 312 Washington St., Newton, Mass.

MOTOR Car Supply Co. (The), 1425-27 Michigan Ave., Chicago, Ill.
(See page 101.)

NOLAN, Wm., 541 Tremont St., Boston, Mass.

NOONAN Tool & Machine Works, 105 E. Dow St., Rome, N. Y.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SMITH, Charles A., Church Lane & P. & R. Ry., Germantown, Philadelphia, Pa.

SMITH Machine Co., H., 51 Godwin St., Paterson, N. J.

TEEL Mfg. Co., 132 Main St., Medford, Mass.

WINSHIP, W. W., 71 Summer St., Boston, Mass.

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NOVELTY & Repair Shop (The), Milford, Ohio.

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ANSONIA Brass & Copper Co., Ansonia, Conn.

BENEDICT & Burnham Mfg. Co., Waterbury, Conn.

BRIDGEPORT Brass Co., Bridgeport, Conn.

BRISCOE Mfg. Co., Detroit, Mich., and Newark, N. J.
(See page 145.)

CHICAGO Brass Co., Kenosha, Wis.

COE Brass Mfg. Co., Torrington, Conn.

DALLAS, A. C., 36 La Salle St., Chicago, Ill.
(See page opposite.)

DETROIT Copper & Brass Rolling Mills, Detroit, Mich.

FRENCH Mfg. Co., Grandview Ave. and Robbins St., Waterbury, Conn.

IVINS, Elwood Tube Works, Oak Lane Station, Philadelphia, Pa.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

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PATTERSON, Gottfried & Hunter, Ltd., 146-150 Centre St., New York, N. Y.

PREST-O-LITE Co. (The), 1904 Broadway, N. Y. City.
(See page 179.)

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ROME Brass & Copper Co., Rome, N. Y.

SIMMONS Co., John, 104-110 Centre St., N. Y. City.

STANDARD Metalwork Co., Thompsonville, Conn.

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DIAMOND Rubber Co., Akron, O.
(See page 183.)

EMPIRE Rubber Mfg. Co., Trenton, N. J.

NEW Jersey Car Spring & Rubber Co., Wayne and Brunswick Sts., Jersey City, N. J.

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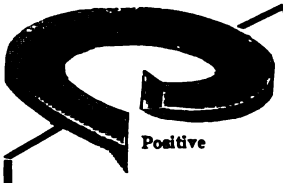

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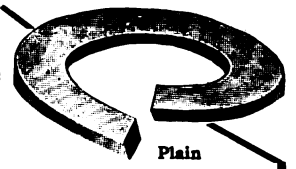

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LAMINATED Tube Co., Columbus, O.

LENG'S Son & Co., John S., 33 Murray St., N. Y. City (Importers).

NATIONAL Tube Co., McKeesport, Pa.

PITTSBURG Seamless Steel Tube Co., Beaver Falls, Pa.

SEAMLESS Tube Co. of America, Frick Bldg., Pittsburg, Pa.

SHELBY Steel Tube Co., 1714 Frick Bldg., Pittsburg Pa.

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CAMBRIA Forge Co., Johnstown, Pa.

COATES Clipper Mfg. Co., Worcester, Mass.
(See page 249.)

COLUMBUS Screw & Machine Co., 244-46 Kaiser St., Columbus, O.

GRAY & Prior Machine Co. (The), Hartford, Conn.

HARTFORD Auto Parts Co., Howard Bldg., Hartford, Conn.
(See page 199.)

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

KINSLER-Bennett Co., 62 Market St., Hartford, Conn.
(See page opposite.)

LEHMAN, I., 61 Middle St., Cleveland, O.

MORAN Flexible Joint Co., 149 3d St., Louisville, Ky.

MUNCIE Auto Parts Co., 700 Elliott St., Muncie, Ind.

MUTUAL Machine Co. (The), 25 Wells St., Hartford, Conn.

PRECISION Appliance Co., 832 Austin Ave., Chicago, Ill.
(See page 135.)

ROSS Tool & Gear Co., 849 Main St., Lafayette, Ind.

SPICER Universal Joint Mfg. Co., 15 Madison Ave., Plainfield, N. J.
(See page 199.)

VANDERBEEK Tool Works, Hartford, Conn.

VALVE LIFTERS

AUTOMOBILE Specialty Co., 509 Willoughby Bldg., Chicago, Ill.
(See page 223.)

NOONAN Tool & Machine Works, 105 E. Dow St., Rome, N. Y.

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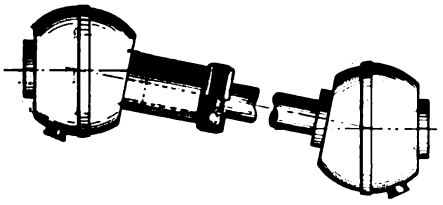

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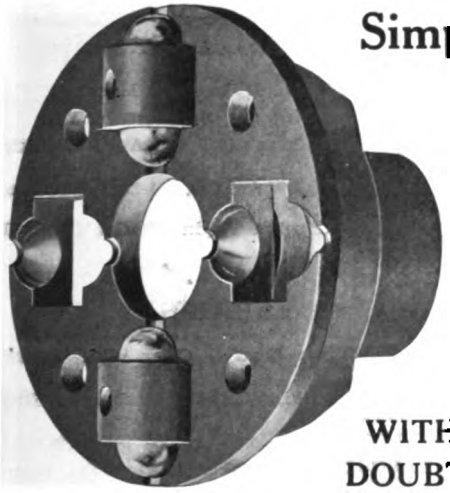

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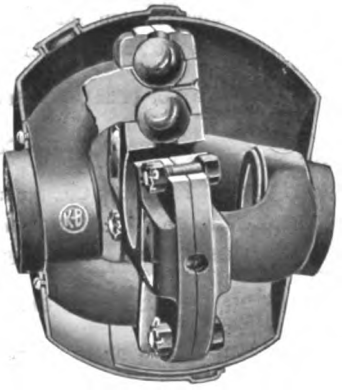

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(See page 245.)

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(See page 83.)

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(See page 113.)

GARAGE Equipment Co., 201 22d St., Milwaukee, Wis.

GRAY-Hawley Mfg. Co., 605-09 Fort St., W., Detroit, Mich.

MOTOR & Mfg. Works Co., Geneva, N. Y.
(see page 129.)

NOONAN Tool & Machine Works, 105 E. Dow St., Rome, N. Y.

POWELL Muffler & Timer Co., 44 La Fayette St., Utica, N. Y.
(see page 251.)

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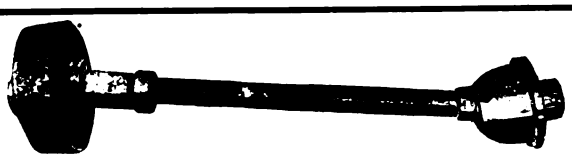

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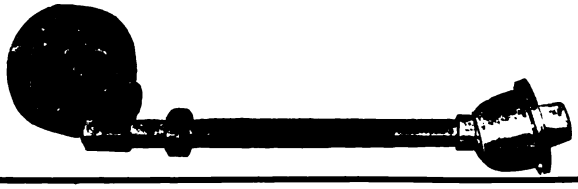

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(See page 225.)

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(See page 229.)

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(See page 223.)

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(See page 93.)

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(See page 69.)

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(See page 221.)

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NEW Jersey Car Spring & Rubber Co., Wayne and Brunswick Sts., Jersey City, N. J.

POSITIVE Lock Washer Co. (The), Newark, N. J.
(See page 195.)

SCHOONMAKER, A. O., 221 Fulton St., N. Y.

STIMPSON Co., Edwin B., 31 Spruce St., N. Y. City.

UPSON Nut Co. (The), Garfield Bldg., Cleveland, O.

WORCESTER Pressed Steel Co., Greendale, Mass.
(See page 143.)

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(See page 75.)

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(See page 93.)

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(See page 89.)

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(See page 243.)

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SCANDINAVIAN Fur & Leather Co., 16 W. 33d St., N. Y. City.

SHAW, Ora D., 109 Kingston St., Boston, Mass.

SPEAR-Martin Fur Co., 41 Church St., Burlington, Vt.

SPRINGFIELD Hat & Cap Co., 27-35 Taylor St., Springfield, Mass.

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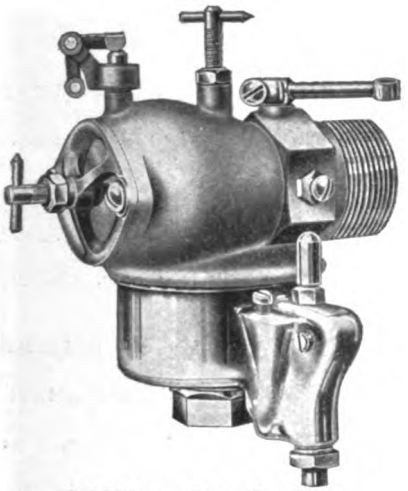

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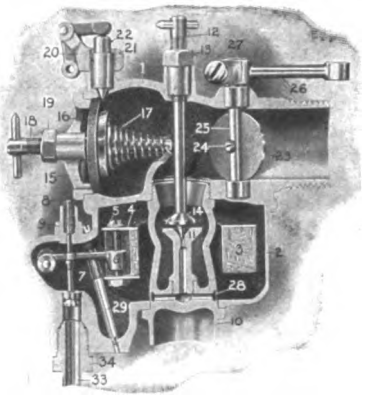

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DEMMERLE & Co., 248 W. 23d St., N. Y. City.

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EISENDRATH Glove Co., Armitage and Elston Ave., Chicago, Ill.

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(See page opposite.)

HANSEN, O. C., Mfg. Co., 356 E. Water St., Milwaukee, Wis.

HEAGLE, James, First Ave. and Market St., Johnstown, N. Y.

KIBBE, C. S., Batavia, N. Y.

LILLEY Co., M. C., Columbus, O.

MORAWETZ Co. (The), 345 Broadway, Milwaukee, Wis.

MORRISON, McIntosh & Co., 63 Broad St., Grinnell, Ia.
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PONTIAC Knitting Co., Pontiac, Mich.

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SYRACUSE & Eldridge Gloves Co., 924 S. Salina St., Syracuse, N. Y.

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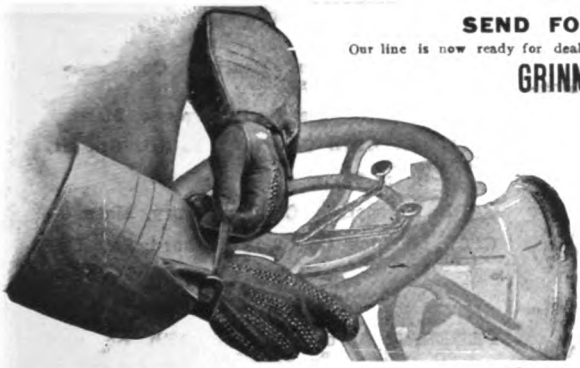

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WAY Muffler Co. (The), 23d and Arch Sts., Philadelphia, Pa.

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(See page 143.)

WHEELS (Sheet Steel)

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INDESTRUCTIBLE Steel Wheel Co., 1303 Michigan Ave., Chicago, Ill.
(See page 221.)

WHEELS (Tubular Steel)

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ARCHIBALD Wheel Co., Lawrence, Mass.

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(See page 177.)

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CITY Machine Co., 9-13 Orchard St., Detroit, Mich.

EAMES, A. M., & Co., So. Framingham, Mass.

FEDERAL Automobile Co., 40th St. and Wentworth Ave., Chicago, Ill.

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(See page opposite.)

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JONES, John E., 173 South St., Utica, N. Y.

JONES, Phineas & Co., 301 Market St., Newark, N. J.
(See page 33.)

LUVERNE Automobile Co., Luverne, Minn.

NATIONAL Wheel Co., Jackson, Mich.

NEUSTADT Auto & Supply Co., St. Louis, Mo.
(See page 99.)

NEW Haven Carriage Co., New Haven, Conn.
(See page 39.)

PRUDDEN & Co., W. K., Lansing, Mich.

PULLWIN Wheel Co. (The), 37 Colony St., Meriden, Conn.

SALISBURY Wheel & Mfg. Co., Jamestown, N. Y.
(See page opposite.)

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STANDARD Wheel Co., Terre Haute, Ind.

TIMKEN Roller Bearing Axle Co., Canton, O.

WAPAKONETA Wheel Co., Wapakoneta, O.

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WHEEL & Wood Bending Co. (The), 141 John St., Bridgeport, Conn.

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(See page 113.)

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BLASIER Mfg. Co., M. E., 68 Columbia St., Utica, N. Y.
(See page 193.)

BRIDGEPORT Vehicle Co., South Ave. and Main St., Bridgeport, Conn.

BROC Carriage & Wagon Co., 1665-67 40th St., N. E., Cleveland, O.

BUOB & Scheu, 408-12 E. Court St., Cincinnati, O.

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CARTIER, Chapman & Co., Ludington, Mich.

CHICAGO Coach & Carriage Co., 1223-1231 Michigan Ave., Chicago, Ill.

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FICKLING & Co., Inc., 154 E. 57th St., N. Y. City.

HARTFORD Auto Body Works, 809 Asylum Ave., Hartford, Conn.

HILL Mfg. Co., 25-27 Fuller St., Buffalo, N. Y.

LIMOUSINE & Carriage Mfg. Co., 35th St. and Michigan Ave., Chicago, Ill.

LONDON Auto Supply Co., 1229 Michigan Ave., Chicago, Ill.
(See page 189.)

MANHATTAN Auto Top Co., 249 W. 64th St., N. Y. City.

MEYER, Morris F., 65-69 E. Woodbridge St., Detroit, Mich.
(See page 193.)

MICHIGAN Top Co. (The), 15-17 Duffield St., Detroit, Mich.

MOTOR Top Co. of New York, 216 W. 50th St., N. Y. City.

NOLAN, Wm., 541 Tremont St., Boston, Mass.

OFF & Co., Christian, Indianapolis, Ind.

PARSONS Buggy Top Co., 70 W. Jackson Blvd., Chicago, Ill.

PIERSER & Wood, 3838 Vernon Ave., Chicago, Ill.

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RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

RITTER Mfg. Co., 243 Jefferson Ave., Detroit, Mich.

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SHAFFER Carriage Co., 938 N. Illinois St., Indianapolis, Ind.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich.
(See page 139.)

SMITH Machine Co., H., 51 Godwin St., Paterson, N. J.

SPRAGUE Umbrella Co. (The), Norwalk, O.
(See page 247.)

STUDEBAKER Bros. Mfg. Co., 378 Wabash Ave., Chicago, Ill.

TEEL Mfg. Co., 132 Main St., Medford, Mass.

TROY Carriage Sunshade Co. (The), Troy, O.

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EASTERN Electric Cable Co., 61-63 Hampshire St., Boston, Mass.

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NEVER-Miss Spark Plug Co., Lansing, Mich.
(See page 115.)

NOONAN Tool & Machine Works, 105 E. Dow St., Rome, N. Y.

O. K. Connector Co., 51 Waldo St., Worcester, Mass.

PITTSFIELD Spark Coil Co., Dalton, Mass.
(See page 157.)

RAJAH Auto Supply Co., 140 Washington St., N. Y. City.

SHAIN, Chas. D., 70 Murray St., N. Y. City.

SPLITDORF, C. F., 261-65 Walton Ave., N. Y. City.
(See page 115.)

STANDARD Battery Connection Co., 27 Copeland St., Roxbury, Mass.

STANDARD Co. (The), Torrington, Conn.
(See page 159.)

TERMINAL Holder Specialty Co. (The), 1251 Michigan Ave., Chicago, Ill.

TREGONING Electric Mfg. Co. (The), 224 High Ave., S. E., Cleveland, O.

WOOD BENDINGS

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J.
(See page 17.)

DANN Bros. & Co. (The), 80-88 Franklin St., New Haven, Conn.

SHEPARD & Sons, H. S., Jamsetown, N. Y. Sts., New Haven, Conn.

TUCKER Wood Work Co. (The), Sidney, O.

WHEEL & Wood Bending Co. (The), 141 John St., Bridgeport, Conn.

WRENCHES

BILLINGS & Spencer Co. (The), Russ and Lawrence Sts., Hartford, Conn.

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COES Wrench Co., Worcester, Mass.

DAVIDSON & Co., J. S., Jamestown, N. Y.

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GRANGER'S Drop Forge Works, 25-29 S. Canal St., Chicago, Ill.

HALL Co., Chas. E., 108 Broadway, N. Y. City.
(See page 167.)

HAMMOND Wrench Co., 26-30 Atlantic Ave., Boston, Mass.

HAWKEYE Wrench Co., Marshalltown, Ia.

HOBSON Wrench Co. (The), Indianapolis, Ind.

HJORTH Wrench Co., Jamestown, N. Y.

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JANNEY, Steinmetz & Co., 4th and Market Sts., Philadelphia, Pa.
(See page 245.)

KILBORN & Bishop Co. (The), 81 Lloyd St., New Haven, Conn.

LAMSON & Sessions Co., 412-453 Scranton Ave., Cleveland, O.

LONG Wrench Co., The J. R., Akron, O.

MASON Wrench & Tool Co., First National Bank Bldg., Chicago, Ill.

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(See page 109.)

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(See page opposite.)

ROTHENBUCHER, Geo. E. R., 102 Hinsdale St., Brooklyn, N. Y.
(See page opposite.)

SMITH & Heminway, 296 Broadway, N. Y. City.

SYRACUSE Wrench Co., Franklin and Water Sts., Syracuse, N. Y.
(See page 213.)

TOWER & Lyon Co., 95 Chambers St., New York, N. Y.

TRIMONT Mfg. Co., Roxbury, Mass.

WAKEFIELD, J. E., 89 Exchange St., Worcester, Mass.

WALDEN Mfg. Co., 65 Beacon St., Worcester, Mass.

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WARREN Axle & Tool Co., Warren, Pa.

WHITMAN & Barnes Mfg. Co. (The), Chicago, Ill.

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(See page 143.)

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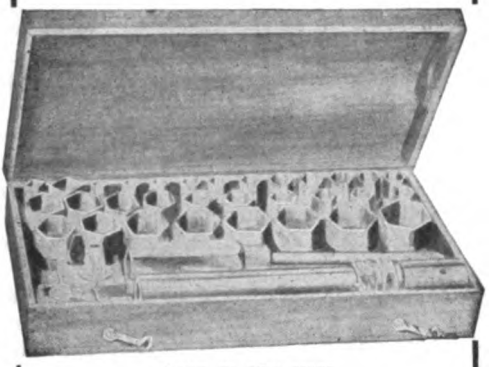

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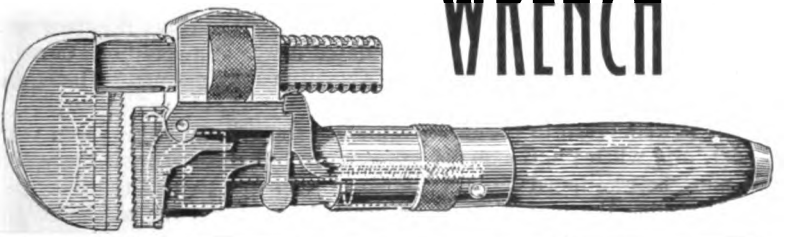

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TABLES AND DATA FOR ENGINEERS

REFERENCE TABLES FOR INDICATED HORSEPOWER

It is often convenient to have a ready reference table, by the aid of which an immediate approximation to the horsepower of a motor can be made when the bore and stroke are known. Such a table has been prepared by Worby Beaumont, the well-known English engineer, who gave permission to the editor of *The Automobile Club Journal* in London to publish it. One table gives the ratings of engines with the cylinder dimensions in inches and fractions, and the other table gives the results with cylinders built to metric measurements. Of course, in a table of this sort, an arbitrary set of conditions as to revolutions, mean effective pressure and mechanical efficiency have to be assumed; those employed represent average practice and the table is not offered as a substitute for experimentation when the most accurate results are desired.

It will be noted from Table I that in a very small space the estimated indicated power of engines with bore and stroke dimensions varying from 2-in. bore and 2-in. stroke to 6-in. bore and 6 1-2-in. stroke is given. Similarly, in Table II, a similar series is given in metric measurement, covering sizes from 70 mm. bore and 70 mm. stroke to 150 mm. bore and 165 mm. stroke. In Table I there is a quarter of an inch difference of size of bore and stroke measurements between any two powers given, and in Table II a difference of 5 mm. In explanation of the tables, it will be seen that in column 1 the bore or cylinder diameter of the engine may be found, and in the columns to the right of this, commencing with the column headed 0, the power of the engine having that cylinder diameter and a stroke of the same dimension. Columns 3 to 10 in each table give the powers of engines of, for instance, the same bore, but having a stroke greater than the bore by the amount stated at the top of the column. For example, referring to Table I, an engine having a cylinder 4 inches in diameter and a stroke of 4 inches would develop, under conditions to be stated, 4.27 i.h.p., as shown in the column headed 0; that is, column 2. If, however, the engine has a cylinder bore of 4 inches and a stroke of 5 1-2 inches, then the power developed is as shown in column 8, 5.89 i.h.p.

Similarly, for example, referring to Table II, an engine having a bore and stroke of 100 mm. would give 4.09 i.h.p., and an engine with a cylinder 100 mm. diameter and 140 mm. stroke would give 5.72 i.h.p.

It will be observed that to each bore dimension in column 1, two horizontal lines are given. The first of these gives the calculated power at a speed of 750 revolutions per minute, and the second the power at 1,000 revolutions per minute. The figures for the higher speed are printed in italic type.

The powers given in the tables represent the calculated indicated power given by one cylinder, and when multi-cylinder engines are being considered, the power shown by the table must be multiplied by the number of cylinders to give the total power.

To determine the useful power or brake horsepower, the mechanical efficiency of the engine has to be considered. No general rule can be given for this, and it may vary from a little less than 80 per cent. of the indicated power to as much as 88 per cent. For the majority of four-cylinder engines of good design and in good condition, run at speeds not unsuited to their design, and for powers of not less than 20 b.h.p., the efficiency may be considered to be 85 per cent. within reasonably close limits of accuracy This figure is, however, merely suggestive, and it is necessary to be familiar with engine design and performances to correctly estimate the brake horsepower from the estimated indicated power of these small high-speed engines.

Very frequently an approximation to the calculated indicated power, or power developed in the cylinders, is all that is required to be known, and this may be taken direct from the tables, for the two named speeds; *i.e.*, 750 or 1,000 revolutions per minute. For other speeds the difference may be taken as arithmetically proportionate through a limited range, according to the type and design of the engine.

Tables on page 214

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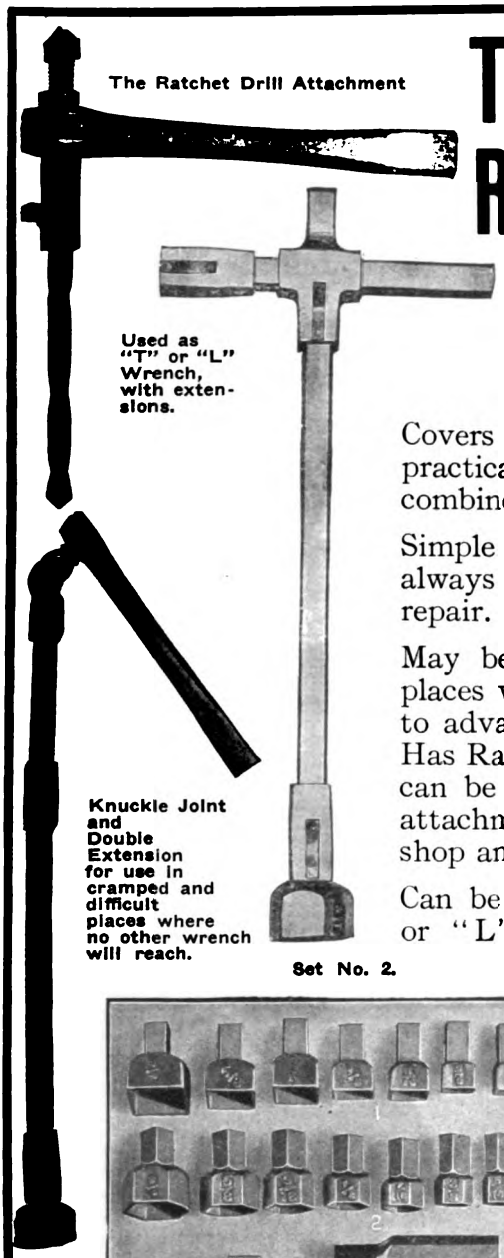
The CHAMPION Ratchet Wrench



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Covers the whole wrench field with a practical Ratchet Drill Attachment combined.

Simple and strong in construction—always ready and never gets out of repair.

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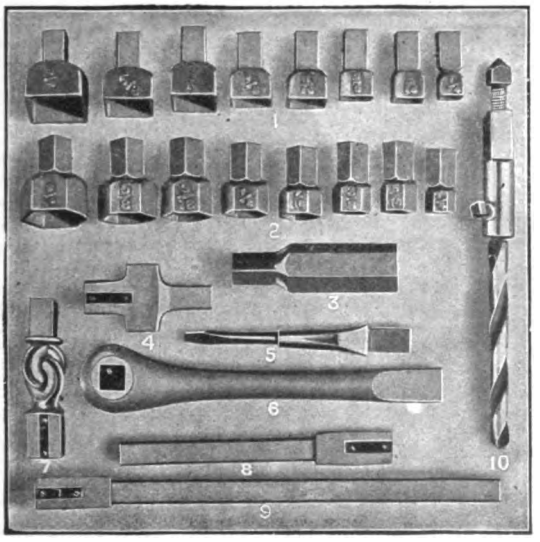
Set No. 2.



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Horsepower Table I.– Cylinder Dimensions in Inches and Fractions.

Bore	0	¼	⅓	¾	1	¼	½	¾	2
2	0.54	0.60	0.67	0.74	0.81	0.88	0.94	1.01	1.08
	0.72	*0.80*	*0.89*	*0.98*	*1.08*	*1.17*	*1.25*	*1.35*	*1.44*
2¼	0.76	0.84	0.92	1.01	1.09	1.18	1.26	1.35	1.43
	1.01	*1.12*	*1.22*	*1.34*	*1.45*	*1.57*	*1.68*	*1.81*	*1.90*
2⅓	1.04	1.15	1.25	1.35	1.46	1.56	1.67	1.77	1.88
	1.39	*1.53*	*1.67*	*1.81*	*1.95*	*2.09*	*2.23*	*2.37*	*2.51*
2¾	1.39	1.51	1.64	1.77	1.89	2.02	2.14	2.27	2.40
	1.85	*2.02*	*2.19*	*2.36*	*2.53*	*2.70*	*2.87*	*3.04*	*3.20*
3	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	3.00
	2.40	*2.60*	*2.80*	*3.00*	*3.21*	*3.40*	*3.61*	*3.81*	*4.00*
3¼	2.30	2.47	2.65	2.82	3.00	3.18	3.36	3.53	3.70
	3.06	*3.28*	*3.52*	*3.76*	*3.99*	*4.22*	*4.45*	*4.70*	*4.92*
3½	2.86	3.06	3.27	3.48	3.68	3.88	4.09	4.30	4.50
	3.81	*4.09*	*4.36*	*4.63*	*4.90*	*5.18*	*5.45*	*5.72*	*6.00*
3¾	3.53	3.76	4.00	4.35	4.47	4.71	4.95	5.18	5.41
	4.71	*5.02*	*5.34*	*5.65*	*5.97*	*6.28*	*6.60*	*6.91*	*7.23*
4	4.27	4.65	4.81	5.08	5.35	5.61	5.89	6.15	6.41
	5.71	*6.06*	*6.42*	*6.78*	*7.13*	*7.50*	*7.85*	*8.20*	*8.55*
4¼	5.13	5.44	5.74	6.04	6.34	6.64	6.95	7.25	7.55
	6.84	*7.24*	*7.64*	*8.05*	*8.45*	*8.85*	*9.25*	*9.66*	*10.06*
4½	6.19	6.53	6.87	7.22	7.56	7.90	8.25	8.59	8.93
	8.25	*8.68*	*9.16*	*9.62*	*10.08*	*10.54*	*10.96*	*11.41*	*11.89*
4¾	7.18	7.55	7.94	8.31	8.70	9.07	9.45	9.82	.....
	9.57	*10.07*	*10.57*	*11.09*	*11.58*	*12.08*	*12.59*	*13.09*	.....
5	8.38	8.80	9.22	9.65	10.05	10.46	10.90	.....	.....
	11.16	*11.72*	*12.28*	*12.84*	*13.40*	*13.95*	*14.50*	.....	.....
5¼	9.70	10.16	10.62	11.09	11.54	12.00	.....	.....	.....
	12.92	*13.54*	*14.15*	*14.76*	*15.40*	*16.00*	.....	.....	.....
5½	11.12	11.65	12.15	12.66	13.15	.....	.....	.....	.....
	14.84	*15.51*	*16.20*	*16.86*	*17.54*	.....	.....	.....	.....
5¾	12.71	13.27	13.82	14.38	.....	.....	.....	.....	.....
	16.96	*17.70*	*18.42*	*19.19*	.....	.....	.....	.....	.....
6	14.45	15.05	15.65	.....	.....	.....	.....	.....	.....
	19.25	*20.05*	*20.85*	.....	.....	.....	.....	.....	.....

Horsepower Table II.—Cylinder Dimensions in Millimeters (Metric System).

Bore	0	5	10	15	20	25	30	35	40
70	1.40	1.50	1.59	1.69	1.80	1.89	1.90	2.10	2.20
	1.87	*2.00*	*2.13*	*2.26*	*2.40*	*2.53*	*2.66*	*2.80*	*2.94*
75	1.72	1.84	1.95	2.07	2.18	2.29	2.41	2.53	2.64
	2.30	*2.45*	*2.60*	*2.76*	*2.91*	*3.06*	*3.22*	*3.37*	*3.52*
80	2.09	2.23	2.35	2.49	2.62	2.76	2.88	3.02	3.14
	2.79	*2.97*	*3.14*	*3.32*	*3.49*	*3.67*	*3.84*	*4.02*	*4.19*
85	2.43	2.65	2.80	2.95	3.09	3.24	3.39	3.54	3.69
	3.34	*3.54*	*3.73*	*3.93*	*4.12*	*4.32*	*4.52*	*4.72*	*4.91*
90	2.97	3.14	3.30	3.46	3.64	3.80	3.96	4.13	4.30
	3.96	*4.18*	*4.40*	*4.62*	*4.85*	*5.06*	*5.28*	*5.50*	*5.72*
95	3.50	3.68	3.87	4.05	4.24	4.42	4.61	4.80	4.98
	4.67	*4.91*	*5.16*	*5.40*	*5.65*	*5.90*	*6.15*	*6.40*	*6.64*
100	4.09	4.29	4.49	4.70	4.90	5.11	5.30	5.51	5.72
	5.45	*5.71*	*5.99*	*6.26*	*6.53*	*6.81*	*7.07*	*7.35*	*7.62*
105	4.73	4.95	5.17	5.40	5.63	5.85	6.08	6.30	6.53
	6.30	*6.60*	*6.90*	*7.20*	*7.50*	*7.80*	*8.10*	*8.40*	*8.70*
110	5.43	5.69	5.93	6.19	6.44	6.68	6.96	7.16	7.42
	7.23	*7.58*	*7.90*	*8.25*	*8.57*	*8.90*	*9.23*	*9.55*	*9.90*
115	6.22	6.48	6.77	7.03	7.30	7.56	7.85	8.11	8.37
	8.30	*8.65*	*9.02*	*9.38*	*9.74*	*10.01*	*10.46*	*10.81*	*11.18*
120	7.07	7.37	7.66	7.96	8.25	8.53	8.84	9.13	9.41
	9.42	*9.82*	*10.21*	*10.61*	*11.00*	*11.30*	*11.70*	*12.18*	*12.57*
125	7.97	8.30	8.63	8.94	9.25	9.57	9.86	10.21	10.54
	10.64	*11.06*	*11.50*	*11.91*	*12.34*	*12.76*	*13.20*	*13.61*	*14.04*
130	8.95	9.30	9.65	9.99	10.34	10.70	11.01	11.38	.....
	11.94	*12.40*	*12.86*	*13.31*	*13.70*	*14.25*	*14.70*	*15.16*	.....
135	10.08	10.44	10.80	11.18	11.56	11.92	12.30	.....	.....
	13.41	*13.91*	*14.40*	*14.90*	*15.41*	*15.90*	*16.40*	.....	.....
140	11.22	11.65	12.04	12.44	12.84	13.25	.....	.....	.....
	14.99	*15.51*	*16.05*	*16.60*	*17.12*	*17.68*	.....	.....	.....
145	12.52	12.98	13.41	13.82	14.25	.....	.....	.....	.....
	16.70	*17.30*	*17.88*	*18.42*	*19.00*	.....	.....	.....	.....
150	13.81	14.26	14.72	15.40	.....	.....	.....	.....	.....
	18.41	*19.01*	*19.64*	*20.27*	.....	.....	.....	.....	.....

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Choosing a Marine Engine

IF there is a harder thing in the world for the ordinary man to select intelligently than a gasoline engine, we don't know what it is—so much has been written and said about them calculated to obscure the vital facts and lead the novice astray. Little by little, this fact has dawned on the layman's mind, till today he is apt to be skeptical of all salesmen's arguments and catalog statements, due to his inability to distinguish between them.

It was with this fact in mind that we determined to issue a book that would be truly helpful to the man about to buy an engine, whether he be expert or novice, and should select our engine or some other. It is our candid opinion that this Treatise will tell you more about how to judge a marine engine than any other book published. We have made it what its name implies—an authoritative work on marine engines—in which every statement could be absolutely relied upon to represent the consensus of opinion as to what constitutes the highest type of marine engine construction.

To make such a book as this of real value to the reader, of course, it must do more than deal in generalities, it must refer in detail to some typical engine that embodies the best marine engine practice. The Ferro engine is referred to throughout the treatise for just this reason—because point by point it embodies what has been found to be best in marine engine design and construction. During the two years in which the Ferro design was being perfected all the most efficient two-cycle engines built were carefully studied and tested, and their good points were all included in the Ferro, while their weak points were just as carefully eliminated. Hence you will find that many faults hitherto found in two-cycle engines have been effectually done away with in the Ferro. Loss of compression either in the cylinder or crank case, loss of incoming gas through the exhaust port, and imperfect oiling devices are some of the important reasons for former two-cycle inefficiency which are not found in the Ferro. With these faults eliminated, the acknowledged advantages of the two-cycle construction, such as lightness of weight, simplicity of design, absence of vibration and greater proportionate power, become more than ever apparent in the Ferro.

If you study this Treatise carefully you can hardly fail to appreciate what extensive factory facilities, what trained men and what thorough mechanical knowledge and skill in marine engine design are required to produce such a perfect motor as the Ferro. For in judging an engine it is almost as important to know what material and methods are used in its manufacture as to be familiar with its mechanical features and design. And when it comes to a detailed comparison from any one of these standpoints we feel perfect confidence in where you must place the Ferro engine—in the very front rank, approached only by a very few engines that sell for a great deal more money but not to be compared in any way with the moderate priced motors that sell for anything like the same price. Not that we ask you to accept this conclusion on our authority, for we are satisfied to leave the matter to your own good judgment after you have carefully looked into all the facts.

To judge rightly what engine to buy, study this Treatise on Marine Engines, which gives you authentic information on marine engines in general and the Ferro in particular, then compare the Ferro, point by point, with any other engine. With thi knowledge, your final judgment should be a wise one, and we will gladly take our chances on the result.

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GRADE		Equal to Angle of	Rise or Fall in One Mile, Feet
Per Cent	Units		
20	1 in 5	11° 19′	1,056
17	1 " 6	9° 26′	880
14	1 " 7	8° 09′	754
12.5	1 " 8	7° 08′	635
11	1 " 9	6° 17′	586
10	1 " 10	5° 43′	528
9	1 " 11	5° 11′	480
8	1 " 12	4° 46′	440
7.75	1 " 13	4° 24′	406
7	1 " 14	4° 05′	337
6.5	1 " 15	3° 49′	352
6.25	1 " 16	3° 35′	330
6	1 " 17	3° 22′	310
5.5	1 " 18	3° 11′	293
5	1 " 19	3° 00′	277
5	1 " 20	2° 52′	204
4	1 " 25	2° 18′	218
3.3	1 " 30	1° 55′	155
2.8	1 " 35	1° 38′	151
2.5	1 " 40	1° 26′	132

HILL-CLIMBING FORMULAS (WORBY BEAUMONT)

W = Weight of car and load in pounds.
w = Weight of car and load in tons.
H = Total ascent in feet.
L = Length of hill in feet.
R = Road resistance in pounds per ton weight of car and load.
r = Air resistance in pounds = $V^2 A$ 0.0017.
V = Velocity of car in feet per second.
A = Area of car in square feet presented to air resistance
T = Time occupied in ascent in seconds.
E = Efficiency of transmission of power from engine to road wheels
$H.P.$ = Effective horse power of engine.
p = Power given off at road wheels or work done in ascending hill.
S = Speed of ascent in miles per hour.

Then if P = Mean effective cylinder pressure
L = Length of stroke in feet.
A = Area of piston in square inches.
N = Number of useful or firing strokes per minute,

the brake horse-power of petrol or steam engines, having a mechanical efficiency of E, is

$$\frac{EPLAN}{33000}$$

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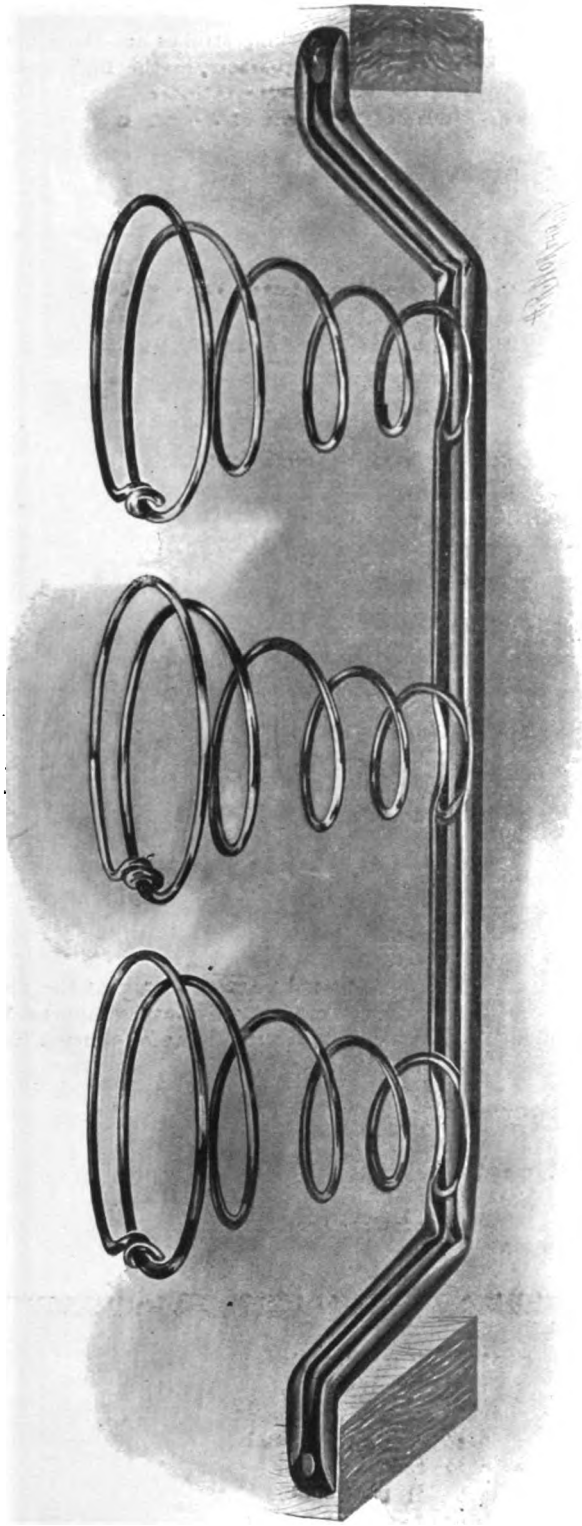

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For compound steam engines the number of useful working strokes are those occurring in the low-pressure cylinder, and the mean effective pressure in the high-pressure cylinder or cylinders is referred to the area of the low-pressure cylinder.

The power given off at the road wheels during the ascent of the hill is

$$p = \frac{HW + (R\,w + r)\,L}{T\ 550}$$

and the brake horsepower required at the engine with a selected value of E is

$$HP = \frac{HW + (R\,w + r)\,L}{TE\ 550}$$

With the other conditions known, the efficiency may be found from

$$E = \frac{HW + (R\,w + r)\,L}{HP.\ T\ 550}$$

the speed of the ascent in miles per hour from

$$S = \frac{\dfrac{L}{HWL + (R\,w + r)}}{HP.\ E\ 550}\ L \times 1.466$$

and the time occupied in the ascent from

$$T = \frac{HW + (R\,w + r)\,L}{HP.\ E\ 550}$$

Unless the probable speed of the car is high, or the wind velocity such that the pressure upon the surface of the car presented to air resistance opposing motion approaches that due to the speed of the car through still air, then the quantity r may be omitted from the foregoing expressions without introducing more than slight error.

SPEED FORMULA

To reduce A miles in B seconds to miles per hour,

$$A \times \frac{3600}{B} = \text{miles per hour.}$$

SPEED EQUIVALENTS IN AMERICAN AND FRENCH MEASUREMENTS

1 mile per hour	=	88	ft. per minute.
	=	1.46	ft. per second.
	=	27.8	metres per minute.
	=	0.463	metre per second.
1 km. per hour	=	0.624	miles per hour.
	=	54.9	ft. per minute.
	=	0.914	metre per second

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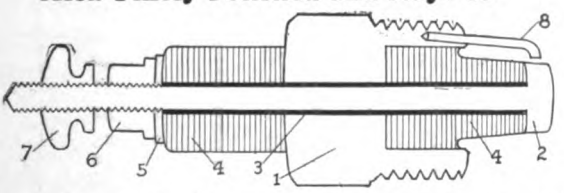

(1) Brass shell (state make of Auto when ordering); (2) Firing pin, steel; (3) Best India sheet mica wrapped around 2 enough turns to give perfect insulation; (4) Best mica disks fit around 3 closely and forced together under great pressure; (5) Copper washer; (6) Brass nut to keep washer in place; (7) Thumb screw for wire or terminal; (8) Spark pin, non-corrosive alloy.

It has double insulation and from its construction it can be seen that pressure from inside the cylinder only tends to make it tighter. Note this plug is partly chambered, and yet the insulation projects out far enough to allow easy cleaning and to get the spark well into the cylinder, thus increasing the power of the engine. No packing is used, therefore none to loosen up or blow out.

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RATE OF SPEED IN MILES PER HOUR FOR ELAPSED TIME OVER THE MEASURED MILE FROM ONE TO THREE MINUTES

Time Over Measured Mile		Rate of Speed in Miles per Hour	Time Over Measured Mile		Rate of Speed in Miles per Hour	Time Over Measured Mile		Rate of Speed in Miles per Hour
Min.	*Sec.*		*Min.*	*Sec.*		*Min.*	*Sec*	
1	0	60.00	1	27	41.38	1	54	31.58
1	1	59.00	1	28	40.91	1	55	31.30
1	2	58.06	1	29	40.45	1	56	31.03
1	3	57.14	1	30	40.00	1	57	30.77
1	4	56.25	1	31	39.56	1	58	30.50
1	5	55.38	1	32	39.13	1	59	30.25
1	6	54.54	1	33	38.71	2	0	30.00
1	7	53.73	1	34	38.29	2	3	29.26
1	8	52.94	1	35	37.89	2	6	28.57
1	9	52.17	1	36	37.50	2	9	27.90
1	10	51.42	1	37	37.11	2	12	27.27
1	11	50.70	1	38	36.73	2	15	26.66
1	12	50.00	1	39	36.36	2	18	26.08
1	13	49.31	1	40	36.00	2	21	25.53
1	14	48.65	1	41	35.64	2	24	25.00
1	15	48.00	1	42	35.29	2	27	24.49
1	16	47.37	1	43	34.95	2	30	24.00
1	17	46.75	1	44	34.61	2	33	23.53
1	18	46.15	1	45	34.28	2	36	23.07
1	19	45.57	1	46	33.96	2	39	22.64
1	20	45.00	1	47	33.64	2	42	22.22
1	21	44.44	1	48	33.33	2	45	21.81
1	22	43.90	1	49	33.03	2	48	21.42
1	23	43.37	1	50	32.72	2	51	21.05
1	24	42.85	1	51	32.43	2	54	20.69
1	25	42.35	1	52	32.14	3	0	20.00
1	26	41.86	1	53	31.86	..	..	.....

REVOLUTIONS PER MINUTE OF AUTO ROAD WEEELS AT DIFFERENT RATES OF SPEED

Diameter of Wheel	MILES PER HOUR									
	2	4	6	8	10	15	20	25	30	40
Inches										
24.....	28	56	84	112	140	210	280	350	420	560
26.....	26	52	78	103	129	194	258	323	388	517
28.....	24	48	72	96	120	180	240	300	363	480
30.....	22	45	67	90	112	168	224	280	306	448
33.....	20	41	61	82	102	153	204	255	380	408
36.....	19	37	56	75	93	140	187	234	240	374
42.....	16	32	48	64	80	120	160	200	206	320

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For Automobile Engines

Have you tried the new composition?

WRITE US

THE STANDARD WELDING CO.
CLEVELAND

Plain Bevel Pattern

National Lock Washer

Furnished in all sizes for locking and holding nuts tight on bolts on all parts of automobiles. This method of securing the nuts GUARANTEED SUPERIOR to any other.

Samples furnished free for test

The NATIONAL LOCK WASHER CO.

65-89 Johnson Street, NEWARK, N. J.

419 MONADNOCK BLOCK, CHICAGO, ILL.

"INDESTRUCTIBLE" STEEL WHEELS

are superior to any wood or steel wheel because they

Never Can Collapse
Never Swell or Shrink
Forever Perpetually Round
No Open Spaces
Enameled NOT Painted
SOLID Sheet Steel (not brazed)

Therefore: Safe, True, Fast, Clean, Handsome, Indestructible

Three Coats of Enamel—Saves You 75% Over Paint

UNANIMOUSLY APPROVED BY THE PUBLIC AT ALL SHOWS

PLEASURE CAR WHEEL READY FOR ANY RIM AND HUB

Manfrs. of all kinds of

Automobile Steel Stampings

Send for Estimates

INDESTRUCTIBLE STEEL WHEEL CO.

Gen'l Offices:

1303 Michigan Avenue, CHICAGO

Works: :: :: :: Lebanon, Ind.

COMMERCIAL WHEEL SHOWING SPREADERS FOR SOLID TIRES

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STRIKING ENERGY OF AUTOMOBILES (DURAND)

Let W = weight of automobile, measured in pounds.
F = average force over the distance required to bring automobile to rest, measured in pounds.
L = distance over which force is exerted to bring automobile to rest, measured in feet.
V = velocity in feet per second,

Then Energy $= \frac{W V^2}{64.4}$ in foot pounds,

$F L$ = measure of destructive work done in stopping the machine

Then $F L = \frac{W V^2}{64.4}$

$$F = \frac{W V^2}{64.4 L}$$

$$L = \frac{W V^2}{64.4 F}$$

Or, otherwise and more generally, let E be any fraction or amount of energy which is lost in overcoming an average resistance F over a distance L.
Then:

$$E = F L$$
$$F = E \div L$$
$$L = E \div F$$

In the actual case of automobile collision, F, as has been carefully noted, is merely a distance average of the force developed. It means simply that there will be as much destructive work done as would correspond to the exhibition of a force F over a distance L. Actually, the destructive work will be made up of parts, each one of which may consist of a very much larger force, acting through such smaller distance as may be needed for the rupture of the part in question.

TRANSMISSION EFFICIENCY OF DIFFERENT TYPES OF MECHANISM (WORBY BEAUMONT)

Source of Loss of Power	Amount of Loss Per Cent.	Efficiency Per Cent.
		100
When driving direct:		
One chain	3.0	..
One and one-half pairs of bearings	7.5	89.5
With epicylic speed gear in operation, add	15.0	74.5
When driving direct:		
One set of gear	5.0	..
Two pairs of bearings	10.0	....
Partially active bearings	3.0	82.0
With change-speed reduction gear in operation, add	12.0	70.0

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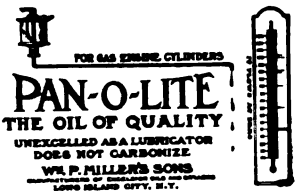


We are making a proposition whereby any dealer who is not already selling **PAN-O-LITE GAS ENGINE CYLINDER OIL** can procure a barrel without **COST** to him.

We are able to do this because **PAN-O-LITE OIL** does things.

Once used **PAN-O-LITE OIL** becomes an inseparable part of the autoist's equipment. The reason: a simple one; **PAN-O-LITE OIL** possesses a combination of qualities unapproached by any other oil on the market.

Write for our proposition.

EXCELSIOR FIBEROUS OIL for the lubrication of sliding transmissions, etc. **A SEMI-SOLID OIL.** The stringy kind. The kind that does not run or drip from bearings or leak from gear cases. Don't fail to get samples and prices on this.

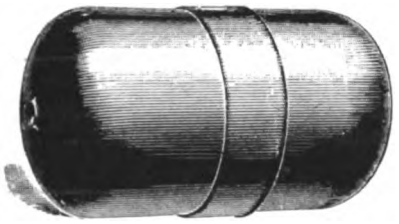
MILLER'S GREASE for the lubrication of all classes of bearings and gears. In use for thirty years by the largest manufacturers in the country and still acknowledged without an equal.

Write us to-day and become acquainted with a line worthy of your consideration.

WM. P. MILLER'S SONS
Manufacturers
73-79 Third St., Long Island City, N. Y.
U. S. A.

Gasoline Tanks

Manufactured from Blue Prints

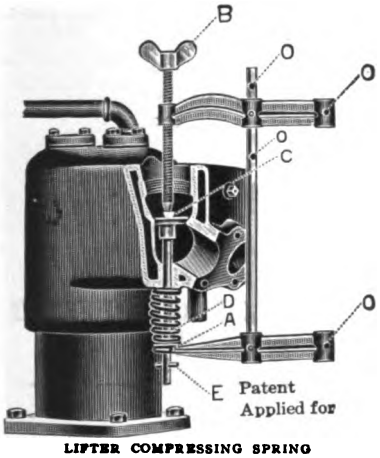


ALL KINDS **HEAVY** SHEET STEEL

Pressed or Stamped

"AUTO PARTS"

THE AVERY STAMPING CO.
5209 Lakeside Ave., Cleveland, O.
ESTABLISHED 1885



LIFTER COMPRESSING SPRING

Save Your Hands Save Time

Two Minutes to Remove Valve

W. & N.

Valve Lifter

It compresses the Spring and Lifts Washer so Key can be removed

No Loss of Patience No Injury to Hands
Simple Durable Practical

No owner of an Auto, Motor Boat, Gas or Gasoline Engine, or Garage as well, can afford to be without it.

Price, $2.00

DIRECTIONS

Place Fork "A" beneath washer or in coil of Spring "D." Turn Thumb Screw "B" until point sets on top of Valve "C" Then screw down until Spring "D" is compressed enough to remove Key "E"

To remove, back up on Screw "B," remove lifter and take out valve, so that necessary grinding, etc., can be done

To replace valve back in position, simply reverse above instructions

"O" represents adjusting holes for different lengths of cylinders and to get over or under exhaust pipes.

AUTOMOBILE SPECIALTY CO. (Not Inc.)

A. J. JACKSON, Manager **Room 509, Willoughby Building, CHICAGO, ILL.**

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Source of Loss of Power	Amount of Loss Per Cent.	Efficiency Per Cent.
		100
One set of gear	5.0	....
Three pairs of bearings	15.0	....
Equivalent of two chains	6.0	74.0
Two sets of gear	10.0	....
Four pairs of bearings	20.0	70.0
Two sets of gear	10.0	....
Five pairs of bearings	25.0	....
Equivalent of one chain	3.0	62.0
Equivalent of three sets of gear	15.0	....
Five pairs of bearings	25.0	60.0

TRACTION EFFORT ON VARIOUS SURFACES (NORRIS)

On rails or plates	5.16 pounds per ton
Asphalt or hardwood	12.24 " " "
Macadam	30.60 " " "
Loose gravel	140 to 200 " " "
Sand	400 " " "
With different tires (comparatively)	
Iron	60 " " "
Solid Rubber	60 " " "
Pneumatic	45 " " "

POWER CONSUMED IN MOVING A PLANE SURFACE AT DIFFERENT VELOCITIES IN THE OPEN AIR (KEMPE)

SPEED IN		Horse-power per Square foot of Effective Surface	SPEED IN		Horse-power per Square foot of Effective Surface
Miles per Hour	Feet per Minute		Miles per Hour	Feet per Minute	
10	880	0.013	50	4,400	1.64
15	1,320	0.044	75	6,600	5.54
20	1,760	0.105	100	8,800	13.13
25	2,200	0.205	150	13,200	44.29
30	2,640	0.354	200	17,600	105.00

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STITCH-IN-TIME VULCANIZER

This Vulcanizer only weighs 1 1-2 pounds, and can be carried in the tool kit of an automobile. Repairs can be made by the roadside if necessary. Make a patch 3 x 2½".
Guaranteed to do all claimed for it or money refunded.

Anybody Can Use It.

Blowouts, Sandboils, glass cuts or other damaged spots on outer casings: torn off stems, split or punctures to inner tubes vulcanized as good as new with our Vulcanizers. We want to send you circulars, and what others say.

"STITCH-IN-TIME" VULCANIZER CO. Topeka, Kan., U. S. A.

"Keep Your Eye on Continentals!"

Continental TIRES

The Low Cost per Mile Tires.

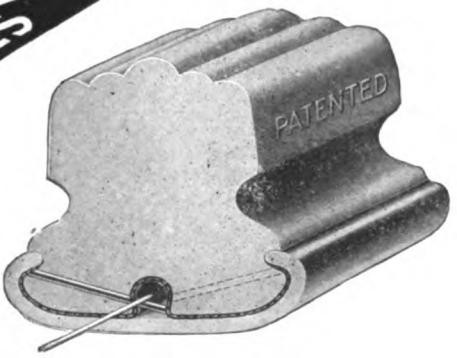
Continental Caoutchouc Co.

J. M. Gilbert, Gen'l Mgr. 43 Warren Street, New York

REPRESENTATION EVERYWHERE

Swinehart TIRES

Four years in the business. Must be good.



Write for booklet "Proof of the Pudding" and new catalog E.

THE SWINEHART CLINCHER TIRE & RUBBER Co
AKRON, OHIO.

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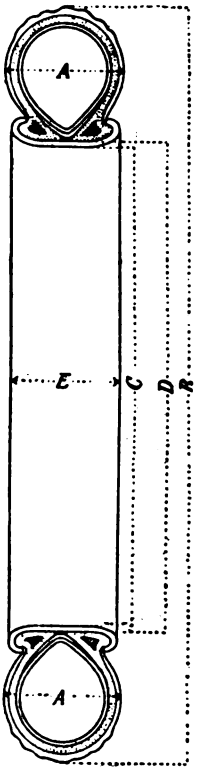
CLINCHER TIRE AND RIM DIMENSIONS



A Inches	*B* Inches	*C* Inches	*D* Inches	*E* Inches
2 1/2	26	18 3/4	19	1 3/8
3	26	19 3/4	20	1 3/8
2 1/2 and 3	28	21 3/4	22	1 3/8
2 1/2 and 3	30	23 3/4	24	1 3/8
3	32	25 3/4	26	1 3/8
3	34	27 3/4	28	1 3/8
3	36	29 3/4	30	1 3/8
3 1/2	28	20 11/16	21	1 3/8
3 1/2	30	22 11/16	23	1 1/2
3 1/2	32	24 11/16	25	1 1/2
3 1/2	34	26 11/16	27	1 1/2
3 1/2	36	28 11/16	29	1 1/2
4	30	21 11/16	22	2
4	32	23 11/16	24	2
4	34	25 11/16	26	2
4	36	27 11/16	28	2
4 1/2	32	22 11/16	23	2 1/4
4 1/2	34	24 11/16	25	2 1/4
4 1/2	36	26 11/16	27	2 1/4

METRIC TIRES AND THEIR AMERICAN EQUIVALENTS

Metric Sizes	Approximate Size in Inches
650 x 65	26 x 2 1/2
700 x 65	28 x 2 1/2
750 x 65	30 x 2 1/2
800 x 65	32 x 2 1/2
830 x 65	33 x 2 1/2
860 x 65	34 x 2 1/2
700 x 85	28 x 3 1/4
750 x 85	30 x 3 1/4
800 x 85	32 x 3 1/4
860 x 85	34 x 3 1/4
760 x 90	30 x 3 1/2
810 x 90	32 x 3 1/2
840 x 90	32 x 3 1/2
870 x 90	34 x 3 1/2
910 x 90	36 x 3 1/2
960 x 90	38 x 3 1/2
1010 x 90	40 x 3 1/2
815 x 105	32 x 4

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HARBURG TIRES

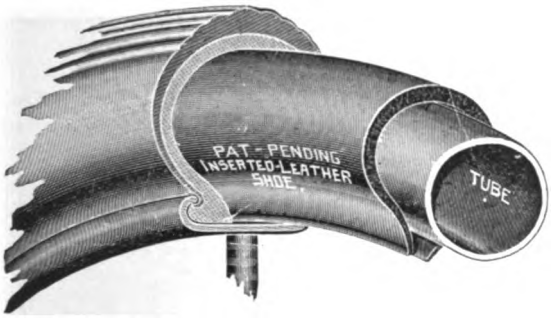
Made in Germany

The safest tire is the Harburg. Can't prove it here. Guaranteed exactly right. Will you, please, inquire?

Harburg Tire Company

232 West 58th St., New York

Boston Tire & Rubber Co., 751 A Boylston St., Boston. Mass.
Callahan, Atkinson & Co., 1020 Morton St., Baltimore, Md.
Harburg Tire Agency, 1140 Bedford Ave., Brooklyn, N. Y
Motor Car Co. of N J 291 Halsey St., Newark, N. J
National Electric Supply Co., 1330 New York Ave., Washington, D. C.
Jos. B. Hoff, Lakewood, N. J.,
The Automobile Exchange, 1340 Vine St., Philadelphia. Pa
Auto Inn, 21-23 Main St., Asbury Park, N. J.
Paterson Automobile Exchange Paterson, N J



The Grinard
Inserted Leather
Auto Shoe

No More Blow Outs

See That Inserted Leather Shoe.

This Shoe is absolutely Blow Out Proof.

Made of Pure Sole Leather only. We guarantee that there is no Fibre or Canvas in this shoe. It is made over a last the same as the shoe you wear on your foot. Each size tire has a last to conform with it, and each leather shoe fits the tire exact. Made in all tire sizes.

Try One In An Old Tire That You Are Casting Away
It Will Run Another Season At Least
Full Set Costs Less Than One New Tire. Interested?

Write Now for Booklet
NO MORE "BLOW OUTS"

Grinard Inserted Leather Shoe Co.

Factory
Olean, N.Y.

CHAS. W. ELLIS, Sales Mgr.
Buffalo, N. Y., U. S. A.

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Metric Sizes	Approximate Size in Inches
875 x 105	34 x 4
915 x 105	36 x 4
820 x 120	32 x 4 1/2-5
850 x 120	33 x 4 1/2-5
880 x 120	34 x 4 1/2-5
920 x 120	36 x 4 1/2-5
1020 x 120	40 x 4 1/2-5
1080 x 120	42 x 4 1/2-5

PROPORTIONS BETWEEN AXLE LOADS AND TIRE SIZES ADOPTED BY AMERICAN TIRE MAKERS

3 1/2-inch tires, all diameters	225 pounds per wheel
2- inch tires, all diameters	350 " " "
3 1/2 x 28-inch tires	400 " " "
3 1/2 x 30-inch tires	450 " " "
3 1/2 x 32-inch tires	555 " " "
3 1/2 x 34-inch tires	600 " " "
3 1/2 x 36-inch tires	600 " " "
4 x 30-inch tires	550 " " "
4 x 32-inch tires	650 " " "
4 x 34-inch tires	700 " " "
4 x 36-inch tires	750 " " "
4 1/2 x 32-inch tires	700 " " "
4 1/2 x 34-inch tires	800 " " "
4 1/2 x 36-inch tires	900 " " "

For weights in excess of 1,000 pounds per wheel, 5-inch tires and over are recommended. Weights given apply to car without passengers.

AIR PRESSURES FOR INFLATING PNEUMATIC TIRES RECOMMENDED BY LEADING MAKERS

Diameter of Tire, Inches	Maximum Weight on Wheel, lbs.	Air Pressure in Tire, lbs. per Square Inch
2 1/2	225	50
3	350	60
3 1/2	600	70
4	750	80
4 1/2	1,000	90
5	1,000	90

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MORGAN & WRIGHT TIRES

stand pre-eminent among auto tires

in the quality and quantity of service given for every dollar of cost

They positively reduce the cost of car maintenance

Clincher—Dunlop—Bailey "Won't Slip" Tread.

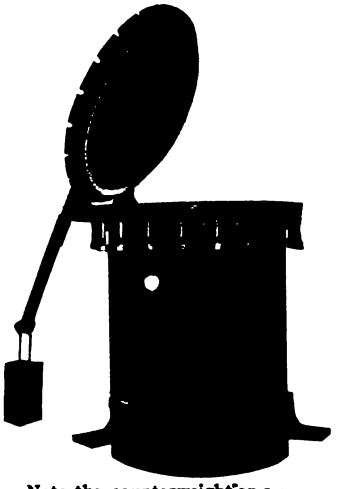
MORGAN & WRIGHT, Detroit, Mich.

DETROIT RUBBER WORKS

New York	Boston	Cleveland	Detroit	Atlanta
Kansas City	Los Angeles	Portland	Syracuse	Philadelphia
Dayton	Minneapolis	St. Louis	Denver	San Francisco

If You Are a Tire Repair Man

looking for the very best outfit for turning out work **correctly** and **quickly**, which means **CHEAPLY**, you will want to see the **"EXCELSIOR"** equipment.



Note the counterweight on cover
One man operates instantly with ease

Our **Standard Steel Retreading Kettle**, 40" diameter, 36" deep, has demonstrated its superiority over any other type so conclusively that it is its own best salesman.

Furnished 42", 48", 54", or 60" deep if desired

For Inner Tubes

The "Excelsior" machine is the **only apparatus** that permits of quick adjustment and at the same time assures an **even cure.** Seven tires can be repaired at once.

Write us for descriptive and illustrated matter, showing **inner tube vulcanizer, vulcanizing boiler, air pump and air receiver.**

PROMPT SHIPMENT

JOHN WISHART MACHINE WORKS
Incorporated
63-65 South Canal Street, CHICAGO

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ASSOCIATION OF LICENSED AUTOMOBILE MANUFACTURERS' STANDARD FOR HEXAGON HEAD SCREWS, CASTLE AND PLAIN NUTS.

The present United States standards for Bolts, Nuts and Screw-threads were established by the United States Navy Department in May, 1868. These standards remained pre-eminent for many years and have proved of great convenience and value. During recent years, however, manufacturers of fine machinery have found from experience that for a large portion of their work the United States standards for pitch of threads have been too coarse, and the dimensions of heads and nuts too large. In order to secure satisfactory construction special fine pitch screw-threads and smaller nuts have had to be made. The number and variety of these special threads and nuts have finally become such that great confusion, inconvenience and expense have been caused. To overcome this condition the Association of Licensed Automobile Manufacturers has adopted a new Screw Standard which is herewith set forth.

It is assumed that where screws are to be used in soft material, such as cast-iron, brass, bronze or aluminum, the existing United States standard pitches will be used.

A. L. A. M. STANDARD

This standard is to be known as "Association of Licensed Automobile Manufacturers' Standard for Hexagon Head Screws, Castle and Plain Nuts."

The term "Screw" is intended to supplant the present so-called "coupling-bolt" and "cap-screw."

The term "Plain Hexagon Nut" is intended to supplant the present so-called "United States Standard Nut."

The term "Castle Nut" is given to a new nut, which is intended to be used where a positive locking system is desired.

The term "Facing" is given to a relieved portion under the screw heads, castle nuts and plain nuts.

The detailed dimensions and specifications of the screws, castle and plain nuts, from one-quarter ($\frac{1}{4}''$) inch to ($1''$) inch inclusive, are as follows:

(*Continued on page 232.*)

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Hartford Machine Screw Company

Any Turned or Milled Piece used on any automobile is within our line of manufacture

Gear Blanks	Thumb Nuts
Hub Caps	Clutch Parts
Turnbuckles	Turned Washers
Screws	Turned Rivets
Nuts	Transmission Parts
Studs	Crank Sleeves
Cam Rollers	Plugs
Taper Pins	Knobs
Spark Plugs	Posts
Pinions	Yoke Pins
Ball Cups	Collars
Ball Cones	Dowel Pins
Chain Studs	Coupling Bolts
Chain Rolls	Couplings
Binding Posts	Steering Gear Spindles
Valve Stems	

Hartford, Conn., U.S.A.

A. L. A. M. Standard Screws and Nuts

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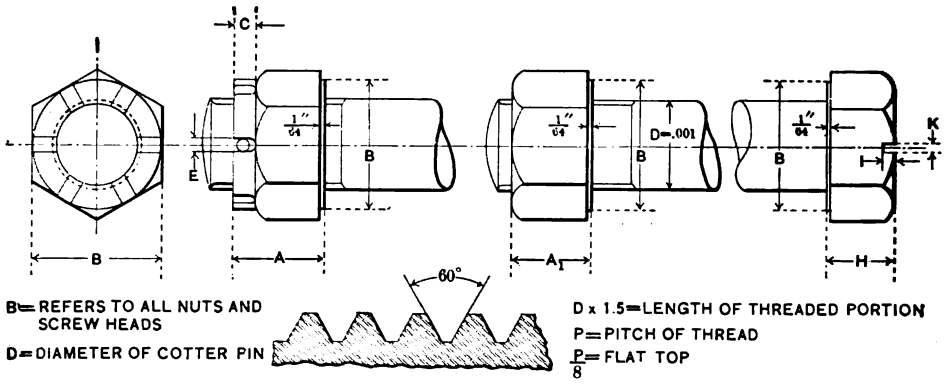
DIMENSIONS



D	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1
P	28	24	24	20	20	18	18	16	16	14	14
A	9/32	21/64	13/32	29/64	9/16	39/64	23/32	49/64	13/16	29/32	1
A	7/32	17/64	21/64	3/8	7/16	31/64	35/64	19/32	21/32	49/64	7/8
B	3/8	1/2	9/16	11/16	3/4	7/8	15/16	1	1 1/8	1 1/4	1 7/16
C	3/32	3/32	1/8	1/8	3/16	3/16	1/4	1/4	1/4	1/4	1/4
E	5/64	5/64	1/8	1/8	1/8	5/32	5/32	5/32	5/32	5/32	5/32
H	3/16	15/64	9/32	21/64	3/8	27/64	15/32	33/64	9/16	21/32	3/4
I	3/32	7/64	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
K	1/16	1/16	3/32	3/32	3/32	3/32	3/32	3/32	3/32	3/32	3/32
d	1/16	1/16	3/32	3/32	3/32	1/8	1/8	1/8	1/8	1/8	1/8

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WE have provided ourselves with a Supply of Special Material, also Taps and Gauges, and are prepared to furnish

Hexagon Head Screws, Nuts, etc.

which we guarantee fully up to the specifications of the A. L. A. M.

Send us your specification

DETROIT SCREW WORKS

DETROIT, MICH.

Standard Set and Cap Screws, Steel Taper Pins, Coupling Bolts, Nuts, etc.

"ANYTHING TURNED FROM BAR"

HARDENED and GROUND WORK OUR SPECIALTY

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SPECIFICATIONS

Material.—A better material than ordinarily used f necessary. The selection of a better material depend extent upon the possibility of commercially machining i Such material has bee found in several qualities of st strength of not less than one hundred thousand (100,c square inch, and an elastic limit of sixty thousand (60, square inch, as compared with fifty or sixty thousand (5 pounds per square inch tensile strength and thirty-five th pounds per square inch elastic limit now in common use

The Screws and Nuts described in this Standard are better material.

Screws are to be left soft.

Screw Heads are to be left soft.

The Plain Nuts are to be left soft.

The Castle Nuts are to be case-hardened.

Tolerance.—The body diameter of the screws shall (.001″) inch less than the nominal diameter, with a plu and a minus tolerance of two-thousandths (.002″) inch.

The nuts shall be a good fit, without perceptible shake

The clearance between tops of threads and bottoms shall be that existing in the present practice of machine s is, the tap shall be between two-thousandths (.002″) inc sandths (.003″) inch large.

Finish.—Screw heads shall be flat chamfered.

Plain nuts shall be flat chamfered.

Castle nuts shall be chamfered.

What is understood by screw makers as "semi-finish" for all heads and nuts.

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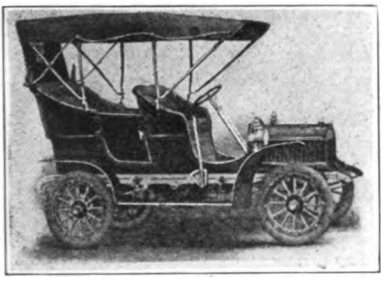
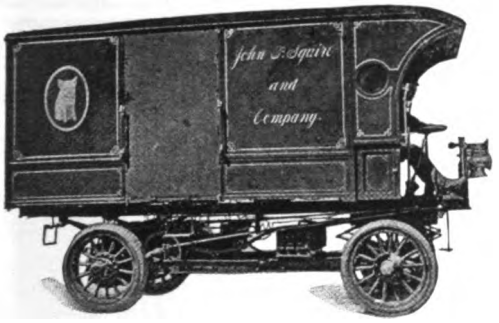


The AUTO TOP CO.

209 E. Columbia

FT. WAYNE, IND.

WE manufacture Auto Tops that have a tone of neatness and style that makes them please. We are ready for a busy year. Write us about your requirements. Our prices and quality are right.



Atlas truck owned by Swift & Co., Boston, packers. Covers 35 miles daily delivering pork products.

Atlas

Gasoline Trucks

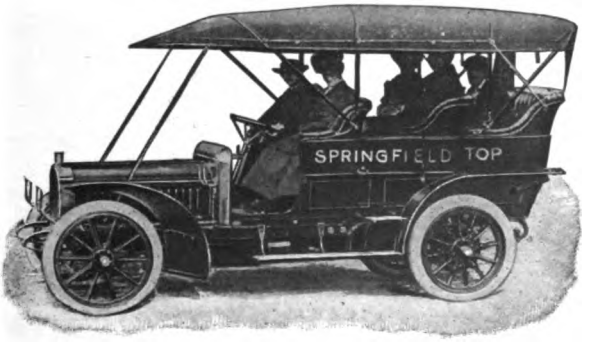
built by

Knox Motor Truck Co.

(Not Knox Automobile Co.)

SPRINGFIELD, MASS.

SPRINGFIELD TOPS



Manufacturers and Agents: LET US FIGURE WITH YOU ON HIGH GRADE TOPS for 1907. Quantity work of the highest grade only our specialty. We are the original American Manufacturers of Folding Automobile Tops. Exclusive materials and designs for 1907.

SPRINGFIELD METAL BODY CO.

387 BIRNIE AVENUE **BRIGHTWOOD, MASS.**

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INTERNATIONAL (METRIC SY

Diameter of Screw	Pitch
Millimetres	*Millimetres*
3	·5
4	·75
5	·75
6	1.0
7	1.0
8	1.0
8	1.25
9	1.0
9	1.25
10	1.5
11	1.5
12	1.5
12	1.75
14	2.0
16	2.0
18	2.5
20	2.5
22	2.5
22	3.0
24	3.0
26	3.0
27	3.0
28	3.0
30	3.5
32	3.5
33	3.5
34	3.5
36	4.0
38	4.0
39	4.0
40	4.0
42	4.5
44	4.5
45	4.5
46	4.5
48	5.0
50	5.0
52	5.0
56	5.5
60	5.5
64	6.0
68	6.0
72	6.5
76	6.5
80	7.0

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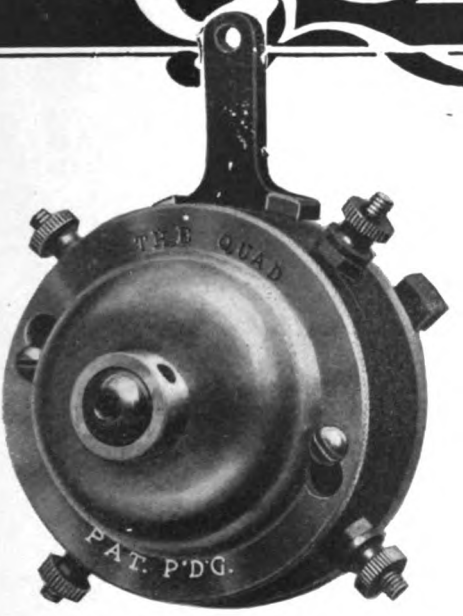
EM) STANDARD 60° THREADS

Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread
Millimetres	*Millimetres*
2.35	.06
3.03	.09
4.03	.09
4.70	.13
5.70	.13
6.70	.13
6.38	.16
7.70	.13
7.38	.16
8.05	.19
9.05	.19
10.05	.19
9.73	.22
11.40	.25
13.40	.25
14.75	.31
16.75	.31
18.75	.31
18.10	.38
20.10	.38
22.10	.38
23.10	.38
24.10	.38
25.45	.44
27.45	.44
28.45	.44
29.45	.44
30.80	.5
32.80	.5
33.80	.5
34.80	.5
36.15	.56
38.15	.56
40.15	.56
42.15	.56
44.51	.63
46.51	.63
48.51	.63
50.86	.69
52.86	.69
54.21	.75
56.21	.75
58.56	.81
60.56	.81
62.91	.88

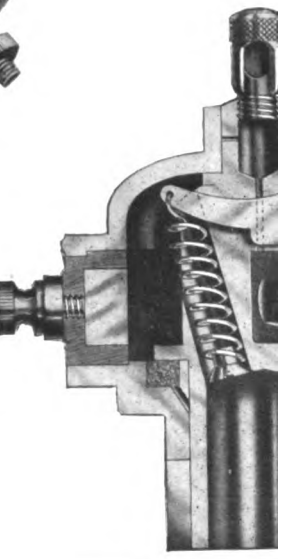
The QUAD



A masterpiece
ingenuity, every
constructed in
degree under our

When you have
we will have pr
timers are like o
right up to the m

Our timer is
with double bea
eccentric wear or
roller supported
the centrifugal fo
contact.



Self-oiling, actually dust-proof, perfectly noiseless, delivers the full current from the batteries to the coil, and is guaranteed to show higher efficiency than any other timer on the market

We will send a sample timer to responsible concerns and if it is not as represented it can be returned at our expense.

Liberal discounts to the trade and special inducements to the manufacturers.

Think This Over and Write Us

The QUAD MF
35-37 SOUTH SCIOT
COLUMBUS, OHIO

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UNITED STATES STAND.

Diameter of Screw	Threads per Inch
1/4	20
5/16	18
3/8	16
7/16	14
1/2	13
9/16	12
5/8	11
3/4	10
7/8	9
1	8
1 1/8	7
1 1/4	7
1 3/8	6
1 1/2	6
1 5/8	5 1/2
1 3/4	5
1 7/8	5
2	4 1/2
2 1/4	4 1/2
2 1/2	4
2 3/4	4
3	3 1/2
3 1/4	3 1/2
3 1/2	3 1/4
3 3/4	3
4	3
4 1/4	2 7/8
4 1/2	2 3/4
4 3/4	2 5/8
5	2 1/2
5 1/4	2 1/2
5 1/2	2 3/8
5 3/4	2 3/8
6	2 1/4

STANDARD PROPORTIO

The report of the committee on standard p
Society of Mechanical Engineers is published
The report is substantially in agreement w
meeting held in New York, April 11, 1904.

The committee believes the following co
and maintaining a standard for the diameters,
as it does, diameters, threads and limits for
therewith: (*a*) form of thread, (*b*) diameter
reference thread gauges, basic and for screws
and taps, (*f*) limits of variation, measured i
in external diameter, (*h*) limits of variation in
proportions of the heads.

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RD 60° SCREW THREADS

Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread
.185	.0062
.2403	.0069
.2936	.0078
.3447	.0089
.4001	.0096
.4542	.0104
.5069	.0114
.6201	.0125
.7307	.0139
.8376	.0156
.9394	.0179
1.0644	.0179
1.1585	.0208
1.2835	.0208
1.3888	.0227
1.4902	.0250
1.6152	.0250
1.7113	.0278
1.9613	.0278
2.1752	.0313
2.4252	.0313
2.6288	.0357
2.8788	.0357
3.1003	.0385
3.3170	.0417
3.5670	.0417
3.7982	.0435
4.0276	.0455
4.2551	.0476
4.4804	.0500
4.7304	.0500
4.9530	.0526
5.1030	.0526
5.2226	.0556

HINE SCREWS.

r machine screws of the American
r, 1906, proceedings of the society.
mendations adopted at the joint

to be essential in establishing
ads of machine screws, including,
h are to be used in connection
threads per inch, (*d*) standard
working gauges for screws
thread. (2) limits of variation (b)

VICTOR GR
H

SHOCK
ABSORBE

Not the only device
called a shock
absorber

de
absorb

WE WILL LEAVE
PRACTICA

(SEE CUT)

It works in Oil with Graduating R
Resistance regulated by By-pa

Price, $75.00 per set of f

Write for particulars. Agents wanted throughou

MUTUAL AUTO. ACCESSORIES C

1937 BROADWAY, NEW YORK

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PROPERTIES OF GASOLINE AN

Properties
Carbon.....
Hydrogen.....
Oxygen.....
Density at 15° C.....
Boiling point.....
Calories per Kg.....
Weight evaporated per hour per dm.² (15. sq. in.) of surface:
1. In experiment room; 18° C.....
2. Outside in the sun; 25° C.....

* 1,302 British heat units per lb. ‡ 75

SPECIFIC GRAVITIES CORRESPO

Baumé Degrees	Specific Gravity
63	0.728
64	0.724
65	0.720
66	0.717
67	0.713
68	0.709
69	c.706
70	0.702
71	0.699

REVERSIBLE CHEMICAL EQUA TAKE PLACE IN THE LEAD ST

CH

(a) $PbO_2 + H_2SO_4 = PbSO_4 +$

(b) $Pb + H_2SO_4 = PbSO_4 + H$

(c) $c = (a) + (b) = PbO_2 + P$

DIS

Equation (*a*) expresses the reactions and (*c*) the combined effect is the fundam

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D DENATURED ALCOHOL (MUNIZ

Gasoline	Denatured Alcohol
84.3 per cent.	41.5 per cent.
15.7 per cent.	13.0 per cent.
.....	45.5 per cent.
.708	.834
88° C.	78.5° C.
*11,359.65	‡6,521.75
9.37 g. (0.33 oz.)	3.47 g. (0.12 oz.
47.21 g. (1.66 oz.)	27.08 g. (0.95 oz.

British heat units per lb.

NG TO BAUME SCALE AT 60° FAH

Baumé Degrees	Specific Gravity
	0.695
72	0.692
73	0.689
74	0.685
75	0.682
76	0.679
77	0.675
78	0.672
79	0.669
80	

SHOWING CHANGES WHICH BATTERY (LAMAR LYNDON)

O

$SO_4 = 2PbSO_4 + 2H_2O$ (2)

itive plate; (b) those at the negative ation of the lead storage battery

Idium Contact Points

A Substitute for

PLATINUM

Wears better. Positively will not oxidize. Increases Horse Power efficiency by producing increased spark flame.

unequa
and long
Platinum.
the trade.

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DURO

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OR WRITE

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14th and Michigan Ave.
Chicago

Southwestern Branch:
3669 Olive St.
ST. LOUIS

Easte
39-41 C
NEW Y

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FORMULAS FOR CONVER

To convert degrees, Centigrade or

Let F = No. of degrees Fahre
C = " " " Centi
R = " " " Réau

$$F = \frac{9C}{5} + 32;$$

$$C = \frac{5(F - 32)}{9}$$

Freezing point, or 32° Fah. = zer
Boiling point, or 212° Fah. = 100

FRENCH AND AMER

MEASU

French	
1 meter	
.3048 meter	
1 centimeter	
2.54 centimeters	
1 millimeter	
25.4 millimeters	
1 kilometer	

MEAS

1 gramme	
.0648 gramme	
28.35 grammes	
1 kilogramme	
.4536 kilogram	
1 tonne or metric ton	
1000 kilograms	

MEAS

1 liter (1 cubic decimeter)	
28.317 liters	
4.543 liters	
3.785 liters	

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ION OF THERMOMETER SCALES

aumur, into degrees Fahrenheit:
eit.
de.
r.

$$F = \frac{9R}{4} + 32;$$

$$R = \frac{4\,(F - 32)}{9}$$

Cent. or Réaumur.
t., or 80° Réaumur.

EQUIVALENT MEASURES

OF LENGTH

	United States
.....	39.37 inches, or 3.2808 feet
.....	1 foot
.....	.3937 inch
.....	1 inch
.....	.03937 inch, or 1/25 inch nearly
.....	1 inch
.....	1093.61 yards, or .62137 mile

WEIGHT

.....	15.432 grains
.....	1 grain
.....	1 ounce avoirdupois
.....	2.2046 pounds
.....	1 pound
.....	.9842 ton of 2,240 pounds
.....	19.68 cwt.
.....	2204.6 pounds

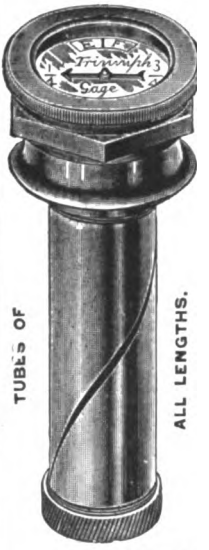
APACITY

...	61.023 cubic inches
	.03531 cubic foot.
	.2642 gallon (American)
	2.202 pounds water at 62° F.
..	1 cubic foot
..	1 gallon (British)
..	1 gallon (American)

The Perfection Buggy Washer
PAT MAY 29 1900

RYAN & LONG
586 Oneida St., - Appleton, Wis.

Triumph



MANUFACT
Boston Auto
Address 613 Old Sout

A Steel of the Highes
EASY T
AND
Treatment
tensile streng
The tensil
Nickel Steel
inch and th
lbs. per squa

We als
"EXC
High
This steel di
air-hardening
easier to wo
and hardenin
and will take
very heavy
drawing its te
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Royal M
2
New

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TABLE OF DECIMAL EQUI
OF AN INCH

	1/64	.0156		17/64	.
	1/32	.0312		9/32	.
	3/64	.0468		19/64	.
1/16		.0625	5/16		.
	5/64	.0781		21/64	.
	3/32	.0937		11/32	.
	7/64	.1093		23/64	
1/8		.125	3/8		
	9/64	.1406		25/64	
	5/32	.1562		13/32	
	11/64	.1718		27/64	
3/16		.1875	7/16		
	13/64	.2031		29/64	
	7/32	.2187		15/32	
	15/64	.2343		31/64	
1/4		.25	1/2		

TABLE OF APPROXIMA

1	2	3	4	5
5 x 12	6x18	6x24	6x36	6x42
	7x12	7x18	7x24	7x30
		8x15	8x18	8x24
		9x12	9x15	9x18

10	15	20	25
8x48			
9x40			
10x32	10x48		
12x24	12x34	12x42	12x50
14x18	14x24	14x30	14x38
	16x18	16x24	16x30

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Every Car Owner Delighted with the Results from their Use.

SELLS ON SIGHT BECAUSE OF THE FOLLOWIN ADVANTAGES

Vibration absorbed. Life of tires prolonged whether over rough roads o smooth. Life and efficiency of engine increased 50 per cent. Less roa resistance. Greater speed. Less fuel. Uniform tension, hence no broke side springs. Nothing to get out of order. No small parts to adjust or o

TRIPLE ACTION SPRING CO. 1254 Michigan Ave. Chicago, Ill

DEALERS, ARE YOU SUPPLIED

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1907 OFFICIAL AUTOMOBILE BLUE BOOKS?

If not, enter your order now and be ready for the Touring Season.

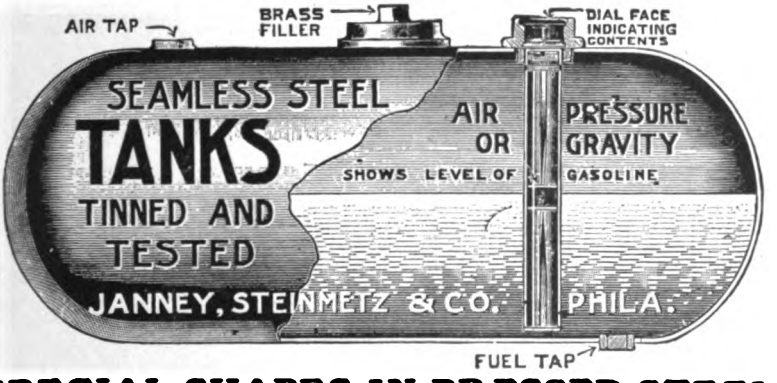
Liberal discount to dealers.

THE CLASS JOURNAL CO., FLATIRON BLDG., NEW YORK.

Seamless Steel Tanks

TINNED AND TESTED

LEAKLESS



RIVETLESS

SPECIAL SHAPES IN PRESSED STEEL

Tanks all sizes from 1 gallon to 100 gallons

FOR AIR PRESSURE OR GASOLINE

NEW CATALOGUE NOW READY

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Reference Table Showing Equivalent Speed in Miles and Kilometers per Hour for Elapsed Time Over the Measured Mile or Measured Kilometer from 24 Seconds Progressively by 1-5 Second to 59 4-5 Seconds.

Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres per hour.	Time of one Kilometre. m. s.	Equal to Kilometres per hour.	Equal to miles per hour.
24	150.00	241.54	24	150.00	93.15
1/5	148.76	239.55	1/5	148.76	92.38
2/5	147.54	237.58	2/5	147.54	91.62
3/5	146.34	235.65	3/5	146.34	90.87
4/5	145.16	233.75	4/5	145.16	90.14
25	144.00	231.88	25	144.00	80.42
1/5	142.86	230.05	1/5	142.86	88.71
2/5	141.73	228.23	2/5	141.73	88.01
3/5	140.62	226.44	3/5	140.62	87.32
4/5	139.53	224.67	4/5	139.53	86.64
26	138.46	222.96	26	138.46	85.98
1/5	137.40	221.25	1/5	137.40	85.32
2/5	136.36	219.58	2/5	136.36	84.68
3/5	135.34	217.94	3/5	135.34	84.04
4/5	134.33	216.31	4/5	134.33	83.42
27	133.33	214.70	27	133.33	82.80
1/5	132.35	213.12	1/5	132.35	82.19
2/5	131.38	211.56	2/5	131.38	81.58
3/5	130.43	210.03	3/5	130.43	80.10
4/5	129.50	208.53	4/5	129.50	80.42
28	128.57	207.03	28	128.57	79.84
1/5	127.66	205.57	1/5	127.66	79.27
2/5	126.76	204.12	2/5	126.76	78.71
3/5	125.87	202.69	3/5	125.87	78.16
4/5	125.00	201.29	4/5	125.00	77.62
29	124.13	199.88	29	124.13	77.08
1/5	123.28	198.52	1/5	123.28	76.55
2/5	122.45	197.18	2/5	122.45	76.04
3/5	121.62	195.84	3/5	121.62	75.52
4/5	120.80	194.52	4/5	120.80	75.01
30	120.00	193.23	30	120.00	74.52
1/5	119.20	191.95	1/5	119.20	74.02
2/5	118.42	190.69	2/5	118.42	73.54
3/5	117.64	189.43	3/5	117.64	73.05
4/5	116.88	188.21	4/5	116.88	72.58
31	116.13	187.00	31	116.13	72.11
1/5	115.38	185.79	1/5	115.38	71.65
2/5	114.65	184.62	2/5	114.65	71.20
3/5	113.90	183.41	3/5	113.90	70.73
4/5	113.21	182.28	4/5	113.21	70.30
32	112.50	181.16	32	112.50	69.86
1/5	111.80	180.03	1/5	111.80	69.43
2/5	111.11	178.92	2/5	111.11	69.00
3/5	110.43	177.82	3/5	110.43	68.57
4/5	109.75	176.73	4/5	109.75	68.15
33	109.09	175.67	33	109.09	67.74
1/5	108.43	174.60	1/5	108.43	67.33
2/5	107.78	173.56	2/5	107.78	66.93
3/5	107.14	172.53	3/5	107.14	66.53
4/5	106.51	171.51	4/5	106.51	66.14
34	105.88	170.50	34	105.88	65.75
1/5	105.26	169.50	1/5	105.26	65.36
2/5	104.65	168.52	2/5	104.65	64.98
3/5	104.04	167.53	3/5	104.04	64.61
4/5	103.45	166.58	4/5	103.45	64.24

Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres per hour.	Time of one Kilometre. m. s.	Equal to Kilometres per hour.	Equal to miles per hour
35	102.85	165.62	35	102.85	63.87
1/5	102.27	164.68	1/5	102.27	63.51
2/5	101.69	163.75	2/5	101.69	63.15
3/5	101.12	162.83	3/5	101.12	62.79
4/5	100.56	161.93	4/5	100.56	62.44
36	100.00	161.03	36	100.00	62.10
1/5	99.44	160.13	1/5	99.44	61.75
2/5	98.90	159.26	2/5	98.90	61.41
3/5	98.36	158.39	3/5	98.36	61.08
4/5	97.82	157.52	4/5	97.82	60.74
37	97.29	156.67	37	97.29	60.41
1/5	96.77	155.83	1/5	96.77	60.09
2/5	96.25	155.00	2/5	96.25	59.77
3/5	95.74	154.17	3/5	95.74	59.45
4/5	95.23	153.34	4/5	95.23	59.13
38	94.73	152.55	38	94.73	58.82
1/5	94.24	151.75	1/5	94.24	58.52
2/5	93.75	150.96	2/5	93.75	58.22
3/5	93.26	150.17	3/5	93.26	57.91
4/5	92.78	149.40	4/5	92.78	57.61
39	92.30	148.64	39	92.30	57.32
1/5	91.83	147.87	1/5	91.83	57.02
2/5	91.37	147.13	2/5	91.37	56.74
3/5	90.91	146.39	3/5	90.91	56.45
4/5	90.45	145.65	4/5	90.45	56.17
40	90.00	144.92	40	90.00	55.89
1/5	89.55	144.20	1/5	89.55	55.61
2/5	89.11	143.49	2/5	89.11	55.33
3/5	88.67	142.78	3/5	88.67	55.06
4/5	88.23	142.07	4/5	88.23	54.79
41	87.80	141.39	41	87.80	54.52
1/5	87.38	140.70	1/5	87.38	54.26
2/5	86.95	140.01	2/5	86.95	53.99
3/5	86.53	139.34	3/5	86.53	53.73
4/5	86.12	138.68	4/5	86.12	53.48
42	85.71	138.02	42	85.71	53.22
1/5	85.30	137.35	1/5	85.30	52.97
2/5	84.90	136.71	2/5	84.90	52.72
3/5	84.50	136.07	3/5	84.50	52.47
4/5	84.11	135.44	4/5	84.11	52.23
43	83.72	134.81	43	83.72	51.99
1/5	83.33	134.18	1/5	83.33	51.75
2/5	82.95	133.57	2/5	82.95	51.51
3/5	82.57	132.96	3/5	82.57	51.27
4/5	82.19	132.35	4/5	82.19	51.04
44	81.81	131.75	44	81.81	50.80
1/5	81.44	131.14	1/5	81.44	50.57
2/5	81.08	130.56	2/5	81.08	50.35
3/5	80.71	129.96	3/5	80.71	50.12
4/5	80.35	129.38	4/5	80.35	49.89
45	80.00	128.82	45	80.00	49.68
1/5	79.64	128.24	1/5	79.64	49.45
2/5	79.29	127.68	2/5	79.29	49.24
3/5	78.94	127.11	3/5	78.94	49.02
4/5	78.60	126.57	4/5	78.60	48.81

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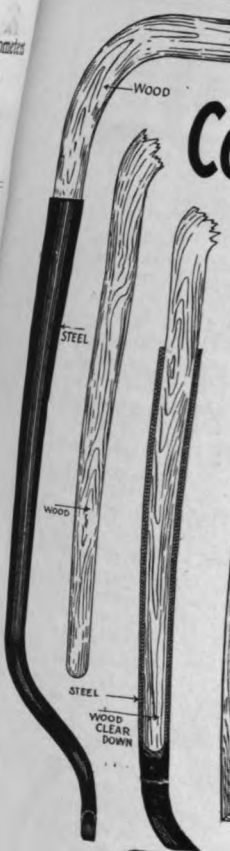
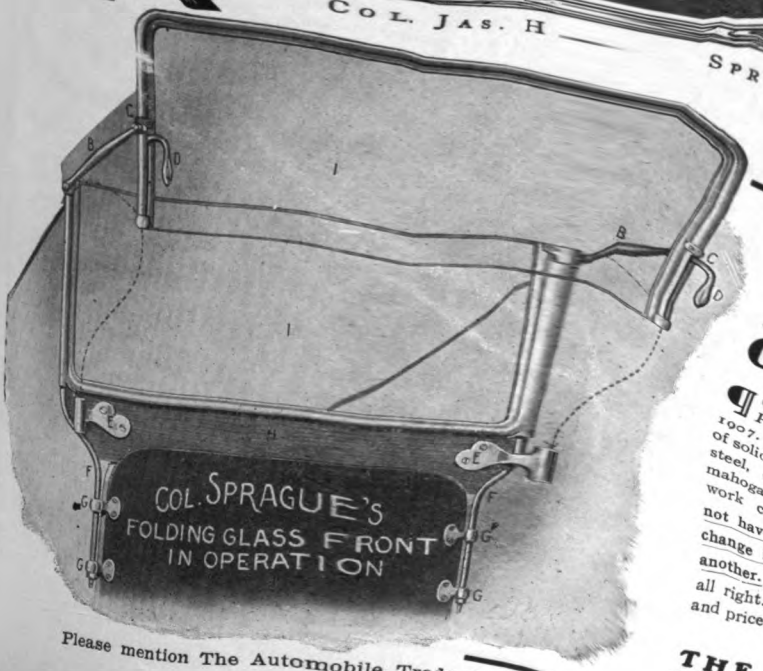
d in Miles and Kilometers
e Measured Mile or
conds Progress-
5 Seconds.

Equal Equal to miles Kilo- per metres hour. per hour.	Time of Equal to Equal one Kilo- Kilo- to mile metre. metres per m. s. per hour. hour
02.85 165.62	35 102.85 [illegible]
02.27 164.68	1/5 102.27 [illegible]
01.69 163.75	2/5 101.69 [illegible]
01.12 162.83	3/5 101.12 [illegible]
00 56 161.93	4/5 100.56 [illegible]
00.00 161.03	36 100.00 [illegible]
99.44 160.13	1/5 99.44 [illegible]
98.90 159.26	2/5 98.90 [illegible]
98.36 158.39	3/5 98.36 [illegible]
97.82 157.52	4/5 97.82 [illegible]
97.29 156.67	37 97.29 [illegible]
96.77 155.83	1/5 96.77 [illegible]
96.25 155.00	2/5 96.25 [illegible]
95.74 154.17	3/5 95.74 [illegible]
95.23 153.34	4/5 95.23 [illegible]
94.73 152.55	38 94.73 [illegible]
94.24 151.75	1/5 94.24 [illegible]
93.75 150.96	2/5 93.75 [illegible]
93.26 150.17	3/5 93.26 [illegible]
92.78 149.40	4/5 92.78 [illegible]
92.30 148.64	39 92.30 [illegible]
91.83 147.87	1/5 91.83 [illegible]
91.37 147.13	2/5 91.37 [illegible]
90.91 146.39	3/5 90.91 [illegible]
90.45 145.65	4/5 90.45 [illegible]
90.00 144.92	40 90.00 [illegible]
89.55 144.20	1/5 89.55 [illegible]
89.11 143.49	2/5 89.11 [illegible]
88.67 142.78	3/5 88.67 [illegible]
88.23 142.07	4/5 88.23 [illegible]
87.80 141.39	41 87.80 [illegible]
87.38 140.70	1/5 87.38 [illegible]
86.95 140.01	2/5 86.95 [illegible]
86.53 139.34	3/5 86.53 [illegible]
86.12 138.68	4/5 86.12 [illegible]
85.71 138.02	42 85.71 [illegible]
85.30 137.35	1/5 85.30 [illegible]
84.90 136.71	2/5 84.90 [illegible]
84.50 136.07	3/5 84.50 [illegible]
84.11 135.44	4/5 84.11 [illegible]
83.72 134.81	43 83.72 [illegible]
83.33 134.18	1/5 83.33 [illegible]
82.95 133.57	2/5 82.95 [illegible]
82.57 132.96	3/5 82.57 [illegible]
82.19 132.35	4/5 82.19 [illegible]
81.81 131.75	44 81.81 [illegible]
81.44 131.14	1/5 81.44 [illegible]
81.08 130.56	2/5 81.08 [illegible]
80.71 129.96	3/5 80.71 [illegible]
80.35 129.38	4/5 80.35 [illegible]
80.00 128.82	45 80.00 [illegible]
79.64 128.24	1/5 79.64 [illegible]
79.29 127.68	2/5 79.29 [illegible]
78.94 127.11	3/5 78.94 [illegible]
78.60 126.57	4/5 78.60 [illegible]



Col. SPRAGUE
NEW
AUTO-BOWS
TOPS and FRONTS

COL. JAS. H. SPRAGUE



Col. SPRAGUE'S
New Folding
Glass Front

¶ Col. Sprague presents
Patent Folding Fro
1907. The sash are made
of solid, pressed brass or b
steel, enameled to imitate
mahogany or rosewood.
work complete, and one
not have to leave the seat
change it from one position
another. Open or closed,
all right. Ask for our catal
and price list.

THE SPRAGU
UMBRELLA
Norwalk, OH

Please mention The Automobile Trade Directory when writing

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Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilo-metres per hour.	Time of one Kilo-metre. m. s.	Equal to Kilo-metres per hour.	Equa to mile per hour
46	78.26	126.02	46	78.26	48.6
1/5	77.92	125.47	1/5	77.92	48.3
2/5	77.58	124.92	2/5	77.58	48.1
3/5	77.25	124.39	3/5	77.25	47.9
4/5	76.92	123.86	4/5	76.92	47 7
47	76.59	123.34	47	76.59	47.5
1/5	76.27	122.81	1/5	76.27	47.3
2/5	75.95	122.30	2/5	75.95	47.1
3/5	75.63	121.78	3/5	75.63	46.9
4/5	75.31	121.27	4/5	75.31	46.7
48	75.00	120.77	48	75.00	46.57
1/5	74.68	120.25	1/5	74.68	46.37
2/5	74.38	119.77	2/5	74.38	46.19
3/5	74.07	119.27	3/5	74.07	46.00
4/5	73.77	118.79	4/5	73.77	45.81
49	73.47	118.30	49	73.47	45.62
1/5	73.17	117.82	1/5	73.17	45.44
2/5	72.87	117.34	2/5	72.87	45.25
3/5	72.58	116.87	3/5	72.58	45.07
4/5	72.29	116.40	4/5	72.29	44.89
50	72.00	115.94	50	72.00	44.71
1/5	71.71	115.47	1/5	71.71	44.53
2/5	71.42	115.00	2/5	71.42	44.35
3/5	71.14	114.55	3/5	71.14	44.18
4/5	70.86	114.10	4/5	70.86	44.00
51	70.58	113.67	51	70.58	43.83
1/5	70.31	113.22	1/5	70.31	43.66
2/5	70.04	112.78	2/5	70.04	43.49
3/5	69.76	112.33	3/5	69.76	43.32
4/5	69.49	111.90	4/5	69.49	43.15
52	69.23	111.48	52	69.23	42.99
1/5	68.96	111.04	1/5	68.96	42.82
2/5	68.70	110.62	2/5	68.70	42.66
3/5	68.44	110.21	3/5	68.44	42.50
4/5	68.18	109.79	4/5	68.18	42.34

(CONTINUE

Steel Balls. "Stand

Size	Decimal	No. per Pound
1/16"	.0625	27,904
3/32"	.0937	8,264
1/8"	.1250	3,400
5/32"	.1563	1,770
3/16"	.1875	1,030
7/32"	.2188	640
1/4"	2500	430
9/32"	.2613	300
5/16"	.3125	220
11/32"	.2438	165
3/8"	.3750	125
7/16"	.4375	80
1/2"	.5000	52
9/16"	.5625	36
5/8"	.6250	28
11/16"	.6875	21
3/4"	.7500	16

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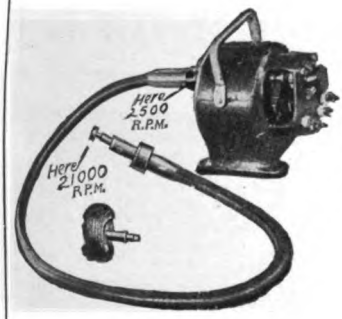
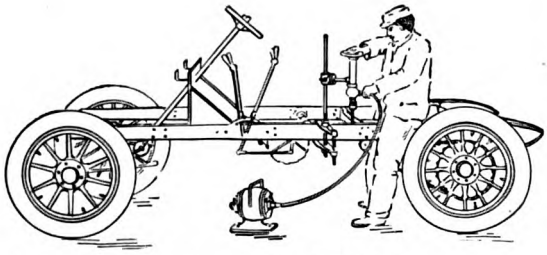
COATES Flexible Shafting

Transmitting
1-10 H. P. to 150 H. P.

Flexible Shafting for Speedometers, Mechanical Oil Pumps, Magneto-Drive, etc.
Varnish Rubbing Outfits electrically driven.



Breast Drills, Grinders and Buffers electrically driven.



Everything in the Flexible Shaft line.
Send for Book 24.

COATES CLIPPER MFG. CO.
WORCESTER, MASS., U. S. A.

Reference Table Showing Equivalent Speed in Miles and Kilometers per [illegible]

Time Over the Measured Mile or Measured Kilometer from 1 Minute to 30 Minutes.

Time for One Mile. m.	s.	Equal to miles per hour.	Equal to Kilometres per hour.	Time of one Kilometre. m.	s.	Equal to Kilometres per hour.	Equal to miles per hour.
1	0	60 00	06.61	1	0	60.00	37.26
1	1	59.00	95.00	1	1	59.00	36.64
1	2	58.06	93.49	1	2	58.06	36.05
1	3	57.14	92.01	1	3	57.14	35.48
1	4	56.25	90.58	1	4	56.25	34.93
1	5	55.38	89.17	1	5	55.38	34.39
1	6	54.54	87.82	1	6	54.54	33.87
1	7	53.73	86.52	1	7	53.73	33.36
1	8	52.94	85.25	1	8	52.94	32.87
1	9	52.17	84.01	1	9	52.17	32.40
1	10	51.42	82.80	1	10	51.42	31.93
1	11	50.70	81.64	1	11	50.70	31.48
1	12	50.00	80.51	1	12	50.00	31.05
1	13	49.31	79.40	1	13	49.31	30.62
1	14	48.65	78.34	1	14	48.65	30.21
1	15	48.00	77.29	1	15	48.00	29.81
1	16	47.37	76.28	1	16	47.37	29.41
1	17	46.75	75.28	1	17	46.75	29.03
1	18	46.15	74.31	1	18	46.15	28.66
1	19	45.57	73.38	1	19	45.57	28.30
1	20	45.00	72.46	1	20	45.00	27.94
1	21	44.44	71.56	1	21	44.44	27.60
1	22	43.90	70.69	1	22	43.90	27.26
1	23	43.37	69.84	1	23	43.37	26.93
1	24	42.85	69.00	1	24	42.85	26.61
1	25	42 35	68.19	1	25	42.35	26 30
1	26	41.86	67.40	1	26	41.86	26.00
1	27	41.38	66.63	1	27	41.38	25.7
1	28	40.91	65.87	1	28	40.91	25.40
1	29	40.45	65.13	1	29	40.45	25.10
1	30	40.00	64.41	1	30	40.00	24.84
1	31	39.56	63.70	1	31	39.56	24.56
1	32	39.13	63.01	1	32	39.13	24.30
1	33	38.71	62.33	1	33	38.71	24.04
1	34	38.29	61.66	1	34	38.29	23.77
1	35	37.89	61.01	1	35	37.89	23.53
1	36	37.50	60.38	1	36	37.50	23.28
1	37	37.11	59.76	1	37	37.11	23.04
1	38	36.73	59.14	1	38	36.73	22.81
1	39	36.36	58.55	1	39	36.36	22.58
1	40	36.00	57.97	1	40	36.00	22.35
1	41	35.64	57.39	1	41	35.64	22.13
1	42	35.29	56.82	1	42	35.29	21.91
1	43	34.95	56.28	1	43	34.95	21.70
1	44	34.61	55.73	1	44	34.61	21.50
1	45	34.28	55.20	1	45	34.28	21.28
1	46	33.96	54.68	1	46	33.96	21.09
1	47	33.64	54.17	1	47	33.64	20.89
1	48	33.33	53.67	1	48	33.33	20.70
1	49	33.03	53.19	1	49	33.03	20.51
1	50	32.72	52.69	1	50	32.72	20.32
1	51	32.43	52.22	1	51	32.43	20.14
1	52	32.14	51.75	1	52	32.14	19.96
1	53	31.86	51.30	1	53	31.86	19.78
1	54	31.58	50.85	1	54	31 58	19.61
1	55	31.30	50.40	1	55	31.30	19.43
1	56	31.03	49.96	1	56	31.03	19.27
1	57	30.77	49.55	1	57	30.77	19.11
1	58	30.50	49.11	1	58	30.50	18.94
1	59	30.25	48.71	1	59	30.25	18.78
2	0	30.00	48.30	2	0	30.00	18.63
2	3	29.26	47.11	2	3	29.26	18.17
2	6	28.57	46.00	2	6	28.57	17.74
2	9	27.90	44.92	2	9	27.00	17.32

Time for One Mile. m.	s.	Equal to miles per hour.	Equal to Kilometres per hour.	Time of one Kilometre. m.	s.	Equal to Kilometres per hour.	Equal to miles per hour.
2	12	27.27	43.91	2	12	27.27	16.93
2	15	26.66	42.93	2	15	26.66	16.55
2	18	26.08	42.00	2	18	26.08	16.20
2	21	25.53	41.11	2	21	25.53	15.85
2	24	25.00	40.25	2	24	25.00	15 52
2	27	24.40	39.43	2	27	24.49	15.21
2	30	24.00	38.64	2	30	24.00	14.90
2	33	23.53	37.89	2	33	23 53.	14.61
2	36	23.07	37.15	2	36	23.07	14.32
2	39	22.64	36.45	2	39	22.64	14.06
2	42	22.22	35.78	2	42	22.22	13.80
2	45	21.81	35.12	2	45	21.81	13.54
2	48	21.42	34.49	2	48	21.42	13.31
2	51	21.05	33.89	2	51	21.05	13.07
2	54	20.69	33.31	2	54	20.69	12.85
2	57	20.34	32.75	2	57	20.34	12 63
3	0	20.00	32.20	3	0	20.00	12.42
3	6	19.35	31.16	3	6	19 5	12.01
3	12	18.75	30.19	3	12	18.75	11.64
3	18	18.18	29.27	3	18	18.18	11.20
3	24	17.64	28.40	3	24	17.64	10 95
3	30	17.14	27.60	3	30	17.14	10 64
3	36	16.66	26.82	3	36	16.66	10.34
3	42	16.21	26.10	3	42	16.21	10.06
3	48	15.79	25.42	3	48	15.79	9.80
3	54	15.38	24.76	3	54	15.38	9.55
4	0	15.00	24.15	4	0	15.00	9.31
4	6	14.63	23.56	4	6	14.63	9.08
4	12	14.28	22.99	4	12	14.28	8.86
4	18	13.95	22.46	4	18	13.95	8.66
4	24	13.63	21.95	4	24	13.63	8.46
4	30	13.33	21.46	4	30	13.33	8.28
4	36	13.04	21.00	4	36	13.04	8.10
4	42	12.76	20.54	4	42	12.76	7.92
4	48	12.50	20.13	4	48	12.50	7.76
4	54	12.24	19.71	4	54	12.24	7.60
5	0	12.00	19.32	5	0	12.00	7.45
5	12	11.54	18.58	5	12	11.54	7.16
5	24	11.11	17.89	5	24	11.11	6.90
5	36	10.71	17.24	5	36	10.71	6.65
5	48	10.34	16.65	5	48	10.34	6.42
6	0	10.00	16.10	6	0	10.00	6.21
6	15	9.60	15.46	6	15	9.60	5.96
6	30	9.23	14.86	6	30	9.23	5.73
6	45	8.88	14.30	6	45	8.88	5.51
7	0	8.57	13.80	7	0	8.57	5.32
7	15	8.27	13.31	7	15	8.27	5.13
7	30	8.00	12.88	7	30	8.00	4.97
7	45	7.74	12.46	7	45	7.74	4.80
8	0	7.50	12.08	8	0	7.50	4.66
8	30	7.06	11.37	8	30	7.06	4.38
9	0	6.66	10.72	9	0	6.66	4.13
9	30	6.31	10.16	9	30	6.31	3.92
10	0	6.00	9.66	10	0	6.00	3.72
10	30	5.71	9.19	10	30	5.71	3.54
11	0	5.45	8.77	11	0	5.45	3.38
11	30	5.21	8.39	11	30	5.21	3.23
12	0	5.00	8.05	12	0	5.00	3.10
13	0	4.61	7 42	13	0	4.61	2.86
14	0	4.28	6.89	14	0	4 28	2.66
15	0	4.00	6.44	15	0	4.00	2.48
20	0	3.00	4.83	20	0	3 00	1.86
30	0	2.00	3.22	30	0	2.00	1.24

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Kilometers per Hour for Elapse from 1 Minute to 30 Minutes.

Equal to Time of Elapse		
kilometres per hour	m	s
43.01	2	12
42.03	2	15
42.00	2	18
41.11	2	21
40.25	2	24
39.43	2	27
38.64	2	30
37.89	2	33
37.18	2	36
36.45	2	39
35.78	2	42
35.12	2	45
34.49	2	48
33.89	2	51
33.31	2	54
32.75	2	57
32.20	3	0
31.16	3	6
30.10	3	12
29.27	3	18
28.40	3	24
27.60	3	30
26.82	3	36
26.10	3	42
25.42	3	48
24.76	3	54
24.15	4	0
23.06	4	6
22.09	4	12
21.40	4	18
21.05	4	24
21.46	4	30
21.00	4	36
20.54	4	42
20.13	4	48
19.71	4	54
19.32	5	0
18.68	5	12
17.89	5	24
17.24	5	36
16.65	5	48
16.10	6	0
15.46	6	15
14.86	6	30
14.30	6	45
13.80	7	0
13.31	7	15
12.88	7	30
12.46	7	45
12.08	8	0
11.37	8	30
10.72	9	0
10.16	9	30
9.66	10	0
9.19	10	30
8.77	11	0
8.39	11	30
8.05	12	0
7.42	13	0
6.89	14	0
6.44	15	0
4.83	20	0
3.22	30	0

The "LEADER"

No. 3

This is an illustration of our No. 3 SINGLE ACTING AUTO JACK, made from Malleable Iron, with Steel Rack Bars, therefore specify Leader Jacks and you will not be deceived.

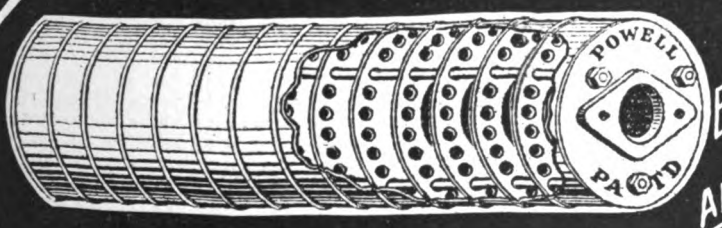
Auto Jacks THAT ARE
Light,
Simple,
Reliable,
Powerful,
Durable.

We also make DOUBLE ACTING JACKS as well.

WRITE US FOR CATALOGUE "A"

Standard Tool Company

432 HARRISON STREET KALAMAZOO, MICH.



Eliminates ALL Noise

POWELL PRESSED STEEL MUFFLER

THE BEST MUFFLER ON THE MARKET

The Most Practical Scientific Application. Quality and Workmanship Unexcelled.

This muffler is made up of a succession of pressed steel cups drawn from sheet metal of No. 16 gauge, each cup shouldered so that it overlaps the bottom of the succeeding one by ¼ of an inch. The number of cups used varying with the size of the engine to be muffled.

The end plates are of heavily ribbed gray or malleable iron, with pipe or flange connection. The perforations are around the outer edge of each baffling plate with an additional one in the center of the first few. The area of these holes varying with the size of engine to be muffled.

In ordering state size of engine cylinder and number, size of exhaust pipe and whether standard pipe, steel or flanged connection is used.

POWELL MUFFLER & TIMER CO.

42 La Fayette Street UTICA, N. Y.

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Motor boat measured mile speed table (elapse feet) and statute miles (5,280 feet) fro seconds. For slower speeds divide

Seconds	1 Minute	Equivalent in Miles	2 Minutes	Equivalent in Miles	3 Minutes	Equivalent in Miles	4 Minutes	
0	60.00	69.06	30.00	34.54	20.00	23.03	15.00	1
1	59.01	67.95	29.75	34.25	19.89	22.90	14.93	1
2	58.06	66.86	29.50	33.07	19.78	22.88	14.87	1
3	57.14	65.80	29.26	33.70	19.67	22.65	14.81	1
4	56.25	64.77	29.03	33.43	19.56	22.52	14.75	1
5	55.38	63.77	28.80	33.16	19.45	22.40	14.69	1
6	54.54	62.80	28.57	32.89	19.35	22.28	14.63	1
7	53.73	61.87	28.34	32.64	19.25	22.16	14.57	1
8	52.94	60.96	28.12	32.38	19.14	22.05	14.51	1
9	52.17	60.07	27.90	32.13	19.04	21.93	14.45	1
10	51.42	59.21	27.69	31.88	18.94	21.81	14.40	1
11	50.70	58.38	27.48	31.64	18.84	21.70	14.34	1
12	50.00	57.57	27.27	31.40	18.75	21.59	14.28	1
13	49.31	56.78	27.06	31.16	18.65	21.47	14.22	1
14	48.64	56.01	26.86	30.83	18.55	21.36	14.17	1
15	48.00	55.27	26.66	30.70	18.46	21.25	14.11	1
16	47.36	54.54	26.47	30.48	18.36	21.14	14.06	1
17	46.75	53.83	26.27	30.25	18.27	21.04	14.00	1
18	46.15	53.14	26.08	30.03	18.18	20.93	13.95	1
19	45.57	52.47	25.89	29.82	18.09	20.83	13.90	1
20	45.00	51.81	25.71	29.40	18.00	20.72	13.84	1
21	44.44	51.17	25.53	29.39	17.91	20.62	13.79	1
22	43.90	50.55	25.35	29.17	17.82	20.52	13.74	1
23	43.37	49.94	25.17	28.98	17.73	20.42	13.68	1
24	42.85	49.34	25.00	28.78	17.64	20.32	13.63	1
25	42.35	48.76	24.82	28.58	17.56	20.22	13.58	1
26	41.86	48.20	24.65	28.39	17.47	20.12	13.53	1
27	41.37	47.64	24.49	28.20	17.39	20.02	13.48	1
28	40.90	47.10	24.32	28.00	17.30	19.93	13.43	1
29	40.45	46.57	24.16	27.82	17.22	19.83	13.38	1
30	40.00	46.06	24.00	27.63	17.14	19.74	13.33	1
31	39.56	45.55	23.84	27.45	17.06	19.64	13.28	1
32	39.13	45.05	23.68	27.27	16.98	19.54	13.23	1
33	38.71	44.57	23.52	27.09	16.90	19.46	13.18	1
34	38.29	44.10	23.37	26.91	16.82	19.37	13.13	1
35	37.89	43.63	23.22	26.74	16.74	19.28	13.09	1
36	37.50	43.18	23.07	26.57	16.66	19.19	13.04	1
37	37.11	42.73	22.93	26.40	16.59	19.10	12.99	1
38	36.73	42.30	22.78	26.23	16.51	19.01	12.95	1
39	36.36	41.87	22.64	26.07	16.43	18.92	12.90	1
40	36.00	41.45	22.50	25.90	16.36	18.84	12.85	1
41	35.64	41.04	22.36	25.74	16.29	18.75	12.81	1
42	35.29	40.64	22.22	25.58	16.21	18.67	12.76	1
43	34.95	40.24	22.08	25.43	16.14	18.58	12.72	1
44	34.61	39.85	21.95	25.27	16.07	18.50	12.67	1
45	34.28	39.48	21.81	25.12	16.00	18.42	12.63	1
46	33.96	39.10	21.68	24.97	15.92	18.34	12.58	1
47	33.64	38.74	21.55	24.82	15.85	18.26	12.54	1
48	33.33	38.38	21.42	24.67	15.78	18.18	12.50	1
49	33.02	38.03	21.30	24.52	15.72	18.10	12.45	1
50	32.72	37.68	21.17	24.38	15.65	18.02	12.41	1
51	32.43	37.34	21.05	24.24	15.58	17.94	12.37	1
52	32.14	37.01	20.93	24.10	15.51	17.86	12.32	1
53	31.85	36.68	20.80	23.96	15.45	17.79	12.28	1
54	31.57	36.36	20.69	23.82	15.38	17.71	12.24	1
55	31.30	36.08	20.57	23.68	15.31	17.63	12.20	1
56	31.03	35.73	20.45	23.55	15.25	17.56	12.16	1
57	30.76	35.43	20.33	23.42	15.19	17.49	12.12	1
58	30.50	35.12	20.22	23.28	15.12	17.41	12.08	1
59	30.25	34.83	20.11	23.16	15.06	17.34	12.04	1

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autical miles (admiralty knot = 6.08
8 min. 59 sec., progressively by
by 2 and divide result by 2.

Equivalent in Miles	6 Minutes	Equivalent in Miles	7 Minutes	Equivalent in Miles	8 Minutes	Equivalent in Miles
81	10.00	11.51	8.57	0.85	[illegible]	[illegible]
77	9.97	11.48	8.55	0.84	[illegible]	[illegible]
73	9.94	11.45	8.53	0.82	[illegible]	[illegible]
68	9.91	11.41	8.51	0.80	[illegible]	[illegible]
63	9.89	11.38	8.49	0.77	[illegible]	[illegible]
59	9.86	11.35	8.47	0.75	[illegible]	[illegible]
54	9.83	11.32	8.45	0.73	[illegible]	[illegible]
50	9.80	11.29	8.43	0.70	[illegible]	[illegible]
45	9.78	11.26	8.41	0.68	[illegible]	[illegible]
41	9.75	11.23	8.39	0.66	[illegible]	[illegible]
37	9.73	11.20	8.37	0.64	[illegible]	[illegible]
32	9.70	11.17	8.35	0.61	[illegible]	[illegible]
28	9.67	11.14	8.33	0.59	[illegible]	[illegible]
24	9.65	11.11	8.31	0.57	[illegible]	[illegible]
20	9.62	11.08	8.29	0.55	[illegible]	[illegible]
16	9.60	11.05	8.27	0.52	[illegible]	[illegible]
11	9.57	11.02	8.25	0.50	[illegible]	[illegible]
07	9.54	10.99	8.23	0.48	[illegible]	[illegible]
02	9.52	10.96	8.21	0.46	[illegible]	[illegible]
99	9.49	10.93	8.19	0.44	[illegible]	[illegible]
95	9.47	10.90	8.16	0.42	[illegible]	[illegible]
91	9.44	10.88	8.14	0.39	[illegible]	[illegible]
87	9.42	10.85	8.12	0.37	[illegible]	[illegible]
83	9.39	10.82	8.10	0.35	[illegible]	[illegible]
79	9.37	10.79	8.08	0.33	[illegible]	[illegible]
75	9.35	10.76	8.06	0.31	[illegible]	[illegible]
71	9.32	10.73	8.04	0.29	[illegible]	[illegible]
67	9.30	10.71	8.02	0.27	[illegible]	[illegible]
63	9.27	10.68	8.01	0.25	[illegible]	[illegible]
59	9.25	10.65	8.01	0.23	[illegible]	[illegible]
56	9.23	10.62	8.00	0.21	[illegible]	[illegible]
52	9.20	10.60	7.98	0.19	[illegible]	[illegible]
48	9.18	10.57	7.96	0.17	[illegible]	[illegible]
44	9.16	10.54	7.94	0.15	[illegible]	[illegible]
41	9.13	10.52	7.93	0.13	[illegible]	[illegible]
37	9.11	10.49	7.91	0.11	[illegible]	[illegible]
33	9.09	10.46	7.89	0.09	[illegible]	[illegible]
30	9.06	10.44	7.87	0.07	[illegible]	[illegible]
26	9.04	10.41	7.86	0.05	[illegible]	[illegible]
23	9.02	10.38	7.84	0.03	[illegible]	[illegible]
19	9.00	10.36	7.82	0.01	[illegible]	[illegible]
16	8.97	10.33	7.80	8.99	[illegible]	[illegible]
12	8.95	10.31	7.79	8.97	[illegible]	[illegible]
09	8.93	10.28	7.77	8.95	[illegible]	[illegible]
06	8.91	10.26	7.75	8.93	[illegible]	[illegible]
03	8.88	10.23	7.74	8.91	[illegible]	[illegible]
00	8.86	10.21	7.72	8.89	[illegible]	[illegible]
97	8.84	10.18	7.70	8.87	[illegible]	[illegible]
94	8.82	10.16	7.69	8.85	[illegible]	[illegible]
91	8.80	10.13	7.67	8.83	[illegible]	[illegible]
88	8.78	10.11	7.66	8.82	[illegible]	[illegible]
85	8.75	10.08	7.64	8.80	[illegible]	[illegible]
82	8.73	10.06	7.62	8.78	[illegible]	[illegible]
79	8.71	10.03	7.61	8.76	[illegible]	[illegible]
76	8.69	10.01	7.59	8.74	[illegible]	[illegible]
73	8.67	9.98	7.57	8.72	[illegible]	[illegible]
70	8.65	9.96	7.56	8.70	[illegible]	[illegible]
68	8.63	9.94	7.54	8.69	[illegible]	[illegible]
65	8.61	9.91	7.53	8.67	[illegible]	[illegible]
62	8.59	9.89	7.51	8.65	[illegible]	[illegible]

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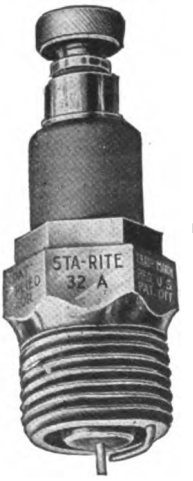

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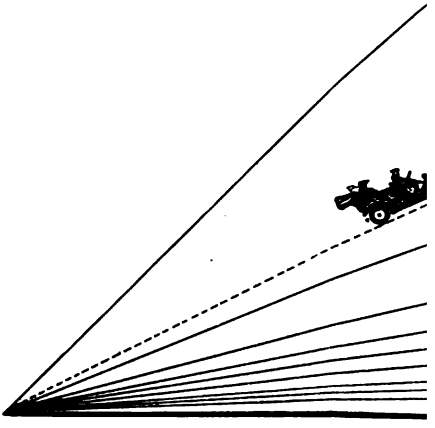

ILLUSTRATING METHOD OF CA

If it be assumed that the base of
long and that the first sloping line re
it 125 feet above the starting point,
or 12½ per cent. In other words, o
the latter instance does not mean
ascending such a slope, but distanc
to that slope. The grade is measure
tion and not by its sine, so that a gra
sponds to an angle of inclination of
perpendicular, as is commonly suppos
line the elevation would amount to 2
one foot for every four feet traveled h
to a 33 1-3 per cent. grade, one in t
until a 100 per cent. grade is reached
45 degree angle.

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T OF GRADES

One in 1, or 100 per cent = 45 degrees angle with horizontal

Approximate angle at which grade becomes

One in 2, or 50 per cent

One in 3, or 33⅓ per cent

One in 4, or 25 per cent

One in 5, or 20 per cent

One in 7½, or 15 per cent

One in 10, or 10 per cent

One in 13, or 7½ per cent

One in 26, or 5 per cent

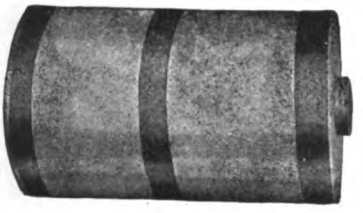
ING GRADE PERCENTAGES.

ngle represents a line 1,000
a road having a rise that
ured as 125 feet in a thousand
of rise for every eight feet
actually traveled by a car
ed horizontally with relation
tangent of the angle of incl
represents 100 per cent
egrees, and not 90 degrees
e upper end of the next
hich is equivalent to a rise
So one in three corresp
0 per cent. grade, and
note 1, is the equivalent

IN ADVANCE

OF THE TIMES

are **"AUTO-POWER"** parts. They **eliminate** the sources of **trouble** common in Automobiles—are **scientifically designed** and **constructed** of the **best materials**. They **reduce** the **cost** of installation and **minimize** maintenance



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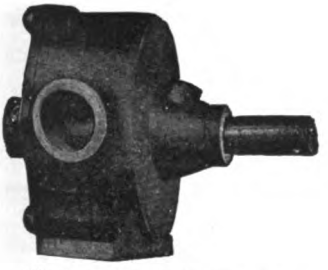
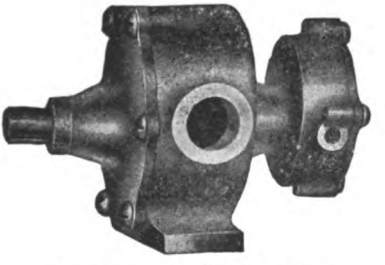


The "Auto-Power" Single Pump Never Leaks. Durable Construction.



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A

Show

Oct. 31-Nov. 7. .—New York City, Ma
Show, Association
Nov. 30-Dec. 7..—Chicago, Coliseum
Automobile Show,
National Associatio
Dec. 12-14.....—St. Louis, Second A
Manufacturers' and
Dec. 28-Jan. 4..—New York City, Ma
Mabley, secretary a
April 6-11.....—Buffalo Convention
Lewis, Manager.

Races,

July 10.....—Cleveland, Ohio, S
Automobile Associa
New York City on
July 13 .....—Rochester, N. Y., G
Automobile Club.
July 13.....—Chicago, Race Meet
Chicago Automobile
July 25-28.....—Providence, R. I., A
cyclists.
July 27.....—Schooley Mountain
Morgan, manager, B
Aug. 1.....—Algonquin, Ill., Hill
mobile Trade Associa
Aug. 5-10.....—Atlantic City, N. J.,
Club.
Aug. 9-10.....—New York City, Bri
United States Motor
Sept. 2.....—Bridgeport, Conn., L
Automobile Club.
Sept. 5.....—Chicago, Cedar Lake
Automobile Trade A
Sept. 14.....—Albany, N. Y., 95-mi
Automobile Club
Oct. 19.....—St. Louis, Mo., Inte
Prize. Aero Club of

Motor

July 20.....—New York to Marble
Rochelle Yacht Club.
Aug. 13-15.....—Chippewa Bay, St.
American Power Boa
Aug. 22.....—New York to Jamesto
Association.
Sept. 2-6.....—Jamestown (Va.) Ex

FC

Sept. 28 - Oct. 7.—Denmark, Copenhager
Nov. 11-23.....—London, Olympia Mot
Nov. 12-Dec. 1..—Paris, Exposition De
planade des Invalides

Races, H

July 14, 1908...—Paris to London, Aeri
July 15-18.....—Ostend Week, Record
July 25.....—Ardennes Circuit, Belg
July 26.....—Ardennes Circuit, Belg
July 27.....—Ardennes Circuit, Belg
July 31-Aug. 8....Belgium Regularity C
Aug. 1-7.....—Criterium of France,
Race for the Press Cu
Aug. 11-29.....—France, Coupe de Auv
Sept. 1-2. .....—Italy, Br escia Circuit,

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The Automobile Trade Directory

A Classified List, issued quarterly, containing the Names and Addresses of all American Manufacturers of Automobiles, Commercial Vehicles, Motor Boats, Motor Cycles and of all makers of component Parts and Accessories

VOL. V NO. 4
OCTOBER, 1907

Subscription Price $1.00 per year
Single Copies 25 Cents, Postpaid

Published by
The Class Journal Company
Flatiron Building, New York

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TO THE TRADE

IN compiling this Directory we have included all the available names of American manufacturers of complete automobiles, commercial vehicles, motor boats and motor cycles, and of all makers of parts and accessories.

The products of the various manufacturers are classified under the principal word, the noun, for instance *Gears, Transmission,* not *Transmission Gears,* and a complete index to these classifications appears on pages 6 to 13 inclusive.

We will consider it a favor if manufacturers will notify us at once in case their names are not included in the Directory, or the information given is in any way incorrect or incomplete, as it is our intention to make the Directory of unquestionable accuracy.

THE PUBLISHERS

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Hartford Suspension
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Heinze Electric Co..
Heitger Carburetor C
Hercules Auto Specia
Hine-Watt Mfg. Co.
Hobbs Mfg. Co.....
Holsman Automobile
Hopewell Bros.....
Hub Lubricator Co..
Hubbard Spring Co.,
Hume Carriage Co..
Huntington Automol
Hydraulic Pressed S

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Imperial Wheel Co
Indestructible Steel
Index Speed Indicato
India Rubber Tire C
Ivins Tube Works,

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Jones & Co., Phinea

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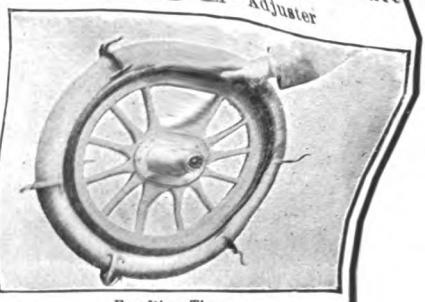

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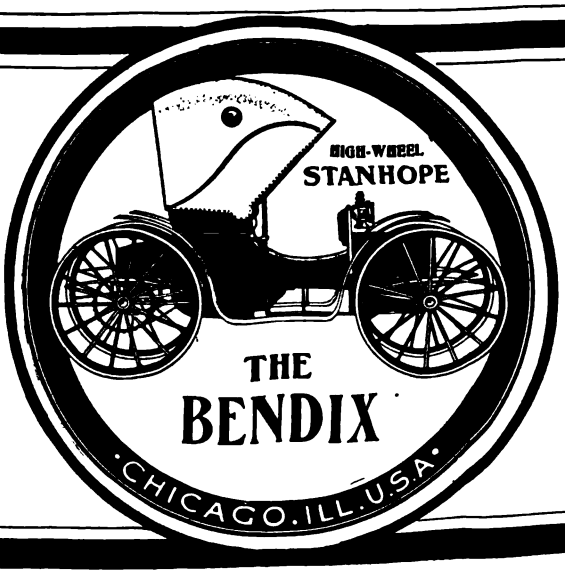

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(See page opposite.)

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DE LUXE Motor Car Co., Detroit, Mich.

DIAMOND T Motor Car Co., Chicago, Ill.

DOLSON Automobile Co., Charlotte, Mich.
(See page 21.)

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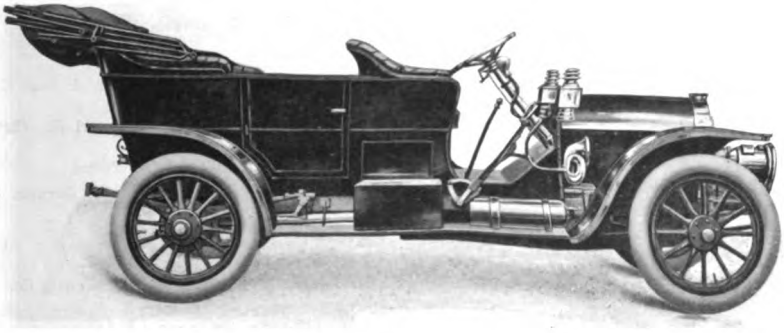

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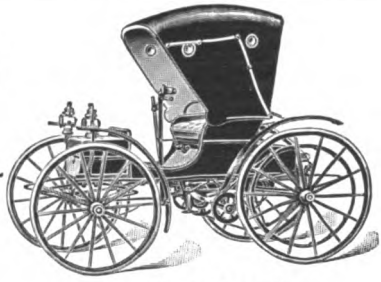

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NOTICE.—Our United States patent 794675 covers broadly *any magnetic gage where a magnet on a shaft is rotated by a float in a tube*, the magnet turning a pointer over a scale.

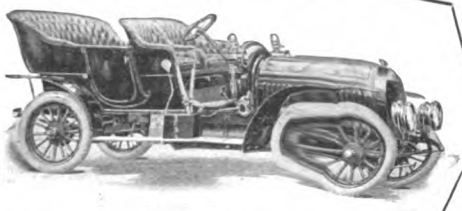
Don't contract for an infringing gage at any price.

☞ All infringers will be prosecuted.

MANUFACTURED ONLY BY

Boston Auto Gage Company

Address 613 Old South Building, Boston, Mass.



We are working on the theory that it is better to refine and improve the already successful Royal Tourist, than to endeavor to sell you a hastily designed experiment.

COMFORT *SPEED* *SAFETY*
40 H. P. *1906 Model G* *$3,500*

ROYAL

The Royal Motor Car Company
Cleveland

Member A. L. A. M. Send for Catalogue

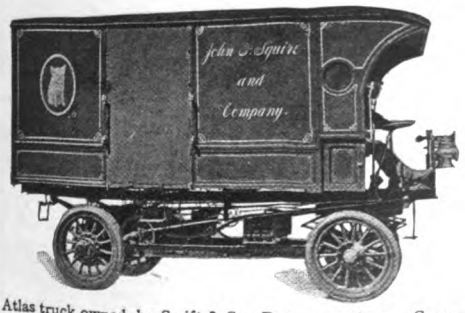
DOLSON 1908

The Dolson Automobile Company announces the completion of its 1908 models and their readiness for immediate delivery to agents. These splendid cars are the elaboration of nearly forty years of vehicle building, and nothing that human skill could devise or ingenuity suggest has been spared to make them the royalty of motordom. In beauty of design and in luxury of appointment; in absolute worthiness of construction; and in all those finer concomitants that go to make up a perfect automobile, 1908 Dolson cars measure up to the highest type of motor car refinement and efficiency. They are veritable Samsons in the automobile world. Power and simplicity have been the Dolson watchwords—and they make for all that is really great in the motor car. The 1908 models are all four-cylinder cars, and comprise the **Dolson Sixty**—seven passengers, **the Dolson Forty,** and the world-famous "**Cannonball.**" There are no frills on the new cars. They are sane and simple in construction, and regal in their marvelous strength and surpassing beauty. Price considered, there is not on top of earth so good, so great, so worthy an automobile as

"THE CAR JOHN DOLSON BUILDS"

The Season of 1908 promises to break all records for sales of high-powered cars. The manufacturing capacity of the Dolson factory has been largely increased for the coming season and we can handle several good contracts in addition to the agencies already established. Immediate deliveries can be made and early correspondence is solicited. We want agents in territory not already represented. Write to us to-day

DOLSON AUTOMOBILE CO. **Charlotte, Michigan**



Atlas truck owned by Swift & Co., Boston, packers. Covers 35 miles daily delivering pork products.

Atlas

Gasoline Trucks

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Atlas Motor Car Co.

SPRINGFIELD, MASS.

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SILENT KNIGHT—See Knight & Kilbourn.

SIMPLEX Automobile Co., 614 E. 83d St., New York, N. Y.

SIMPLEX Motor Car Co., Mishawaka, Ind.

SIMPLICITY—See Evansville Auto Co.

SINGLE Center Buggy Co., Evansville, Ind.

SIX-TEEN-SIX—See Winton Motor Carriage Co.

SMITH Automobile Co., 618 Quincy St., Topeka, Kan.

SOVEREIGN—See Matthews Motor Co.

SPEEDWELL Motor Car Co., Dayton, O.

SPRINGFIELD—See Med-Bow Auto Co.

SPRINGFIELD Automobile Co., Springfield, Mass.

STANLEY Automobile Mfg. Co., Mooreland, Ind.

STAR Automobile Co., Plymouth Bldg., Chicago, Ill.

STAVER Carriage Co., 76th & Wallace Sts., Chicago, Ill.

STEARNS Co., F. B., Euclid & Lake View Aves., Cleveland, O.

STEEL-Swallow Auto Co., Jackson, Mich.

STEVENS-Duryea Co., Chicopee Falls, Mass.

STILSON Motor Car Co., 92 Renne Ave., Pittsfield, Mass.

STODDARD-DAYTON—See Dayton Motor Car Co.

STREATOR Motor Car Co., Streator, Ill. "Halliday."

STUDEBAKER Automobile Co., South Bend, Ind.

SUCCESS Auto-Buggy Mfg. Co., 528 De Baliviere Ave., St. Louis, Mo.

SUMMIT Carriage-Mobile Co., 512 La Fayette St., Waterloo, Iowa.

THOMAS-Detroit Co., E. R., Detroit, Mich. "Thomas-Forty."

THOMAS FLYER—See Thomas Motor Co.

THOMAS-FORTY—See Thomas-Detroit Co.

THOMAS Motor Co., E. R., 1200 Niagara St., Buffalo, N. Y. "Thomas Flyer."

TINCHER Motor Car Co., 310-17 S. St. Joe St., South Bend, Ind.

TOURIST—See Auto Vehicle Co.

TRAVELER—See Bellefontaine Automobile Co.

TWYFORD Motor Car Co., Brookville, Pa.

VANDEGRIFT Automobile Co., Philadelphia, Pa. "Autocycle."

VICTOR Automobile Co., Ridgeville, Ind. "Senator."

VICTOR Automobile Mfg. Co., 171 Carroll St., St. Louis, Mo.

VICTORY Motor Car Co., San Jose, Cal.

WALTER Auto Co., Whitehead Road, Trenton, N. J.

WALTHAM-ORIENT—See Waltham Mfg. Co.

WALTHAM Mfg. Co., Waltham, Mass. "Waltham-Orient."

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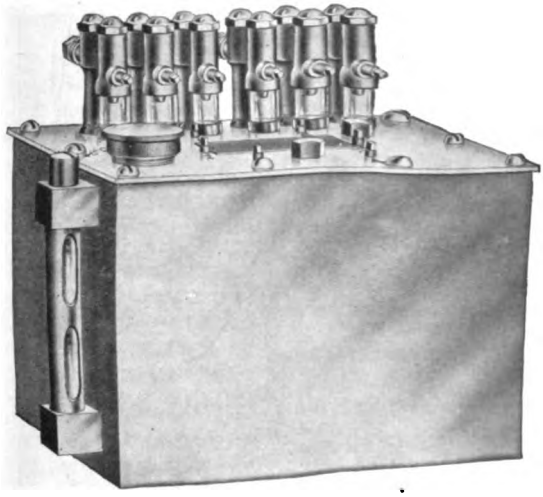
MECHANICAL *LUBRICATOR*
FOR AUTOMOBILES, Etc.



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ARE MARVELS OF THE MANUFACTURER'S ART. NEAT IN APPEARANCE, COMPACT IN FORM, AND THEIR RESULTS POSITIVE

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GASOLINE COMMERCIAL VEHICLES

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AMERICAN Machine Mfg. Co., 133-37 Beaubien St., Detroit, Mich. "Commerce."

AMERICAN Motor Truck Co., Lockport, N. Y.

ATLAS Motor Car Co., Springfield, Mass. (See page 21.)

AUTO-CAR Equipment Co., 77-79 Edward St., Buffalo, N. Y.

BUCKEYE Mfg. Co., Anderson, Ind. "Lambert."

BUFFALO Auto-Truck & Motor Co., 123 Erie County Bank Bldg., Buffalo, N. Y.

CADILLAC Motor Car Co., Detroit, Mich.

CARTERCAR—See Motor Car Co.

CHASE Motor Truck Co., 232 E. Water St., Syracuse, N. Y.

CLIMAX—See Hinde & Dauch.

COMMERCE—See American Machine Mfg. Co.

COMMERCIAL Motor Car Co., Times Bldg., New York, N. Y.

COMMERCIAL Motor Truck Co., Pine & Bell Sts., Plymouth, O. "Plymouth."

COMMERCIAL Truck Co., Philadelphia, Pa.

COPPOCK Motor Car Co., Marion, Ind.

CORBIN Motor Vehicle Corporation, New Britain, Conn.

COVERT Motor Vehicle Co., Lockport, N. Y.

DAIMLER Mfg. Co., 959 Steinway Ave., Long Island City, N. Y.

DEERE-Clark Motor Car Co., Moline, Ill.

EMPIRE State Engineering Works, 555 E. 116th St., New York City.

FRANKLIN Mfg. Co., H. H., Syracuse, N. Y.

FRAYER-MILLER—See Lear Automobile Co.

GAETH Automobile Works, 900 Pearl St., Cleveland, O.

GALE—See Western Tool Works.

HEWITT Motor Co., 10 E. 31st St., N. Y. City.

HINDE & Dauch, Sandusky, O. "Climax."

HOTEL & Railroad News Co., 74 Franklin St., Boston, Mass.

IDEAL Mfg. Co., Portsmouth, O.

IROQUOIS Iron Works, Buffalo, N. Y.

JEFFERY & Co., Thos. B., Kenosha, Wis. "Rambler."

KANSAS City Motor Car Co., Sheffield Station, Kansas City, Mo.

KARBACH Automobile & Vehicle Co., 13th & Howard Sts., Omaha, Neb.

KNOX Automobile Co., Springfield, Mass.

LEAR Automobile Co., Oscar, Springfield, O. "Frayer-Miller."

LENDE Automobile Mfg. Co., Century Bldg., Minneapolis, Minn.

LINCOLN Automobile Co., Lincoln, Ill.

LOGAN Construction Co., Chillicothe, O.

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COLUMBUS, OHIO

BRASS
BRONZE
ALUMINUM

PARSON'S MANGANESE BRONZE
or our own Alloy

Manganese Bronze Front Axles, Change Speed Levers, Emergency Brake Levers, Connecting Rods, Lamp Brackets, etc.

Reliability and Promptness

Let us figure on your 1908 requirements

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ELECTRIC Vehicle Co., Hartford, Conn. "Columbia."

ELWELL-Parker Electric Co., 1076 Hamilton St., Cleveland, O.

GENERAL Vehicle Co., Borden & Review Aves., Long Island City, N. Y.

HERCULES—See McNaughton Co.

LANSDEN Co., 54 Lackawanna Ave., Newark, N. J.

McCREA Motor Truck Co., Am. Trust Bldg., Cleveland, O. "Champion."

McNAUGHTON Co., James, 29 W. 42d St., N. Y. City. "Hercules."

PITTSBURG Motor Vehicle Co., Pittsburg, Pa.

POPE Motor Car Co., Indianapolis, Ind. "Waverly."

STUDEBAKER Automobile Co., South Bend, Ind.

SYNNESTVEDT Machine Co., 4117 Liberty Ave., Pittsburgh, Pa.

WAVERLY—See Pope Motor Car Co.

STEAM COMMERCIAL VEHICLES

HALSEY, James T., 336 York Ave., Philadelphia, Pa.

JOHNSON Service Co., 149-53 Michigan St., Milwaukee, Wis.

MICHIGAN Steam Motor Co., Pontiac, Mich.

PITTSBURGH Machine & Tool Co., Larock & Darrah Sts., Allegheny, Pa.

TRACTOR Co., Third & Trumbull Sts., Elizabethport, N. J.

WHITE Co., Rose Bldg., Cleveland, O.

MOTOR BOATS

ACKER, H., Tottenville, Staten Island.

AMERICAN Boat & Machine Co., 3517 So. Second St., St. Louis, Mo.

AMERICAN Yacht & Motor Co., Cherokee & DeKalb Sts., St. Louis, Mo.

ATLANTIC Co., Amesbury, Mass.

AUTO Boat Co., West Mystic, Conn.

AYERS & Son, A., Nyack, N. Y.

BEERS Bros. Engine Co., Culver Road, Rochester, N. Y.

BELLOWS, M. S., Chateaugay Lake, N. Y.

BENTER, Worth S., Catskill, N. Y.

BROOKS Boat Mfg. Co., Saginaw, Mich.

DeMOOY Bros., 1831-36 E. 55th St., N. E., Cleveland, O.

DETROIT River Boat & Oar Co., foot of Eureka Ave., Wyandotte, Mich.

DUPLEX Roller Bushing Co., Belfast, Me.

DUTTON Engineering Co., Perth Amboy, N. J.

ECHO Company, Delaware & Young Sts., Tonawanda, N. Y.

ELECTRIC Launch Co., Bayonne, N. J.

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Increased power

Greater safety

More comfort

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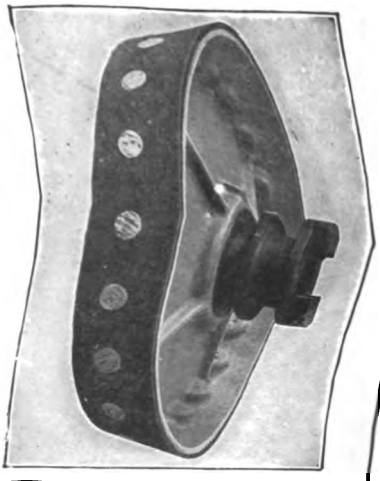
by using



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Cork Insert Clutches give a gradually increasing contact until full torque is reached, *absence of slip when engaged*, and transmit all the power the engine develops.

Cork Insert Brakes mean much to you and your car. In crowded city streets and many other tight places, these quick, *sure to hold* brakes meet every requirement of safety.

Used in thousands of cars by the thirty-four manufacturers here given

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The Frontenac Motor Co.
The Deere-Clark Motor Car Co.
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The Reliance Motor Car Co.

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The Coppock Motor Car Co.

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Brakes.
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The Dayton Electrical Mfg. Co.

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The Stevens-Duryea Co.
The Northway Motor & Mfg. Co.
The Jackson Motor Car Co.
The Bay State Automobile Co.

National Brake & Clutch Co., 16 State St., Boston

Owner and Patentee

Standard Brake Co.
Representative
101 W. 66th St.
New York

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TOLEDO Motor Boat & Power Co., F Washington St., Toledo, O.

TOPPAN Boat Mfg. Co., 9 Haverhi Boston, Mass.

TOQUET Launch & Motor Co., Saug Conn.

TRUSCOTT Boat Mfg. Co., St. Joseph,

TUTTLE Co., D. M., Canastota, N. Y.

WILLIAMS-Whittlesey Co., Steinway, Island City, N. Y.

WOOD, B. F., City Island, N. Y.

WRIGHT, U. G., Paulsboro, N. J.

YACHT, Launch & Engine Co., Philadelp Pa.

MOTOR CYCLES

AMERICAN Motor Co., 705 Centre S Brockton, Mass. "Marsh." "Metz."

APACHE—See Brown & Beck.

ARMAC Motor Co., 472-78 Carroll Ave., Chi cago, Ill.

BRADLEY Motor Co., C. E., 268 Diamon St., Philadelphia, Pa.

BROWN & Beck, 1737 Champa St., Denver, Colo. "Apache."

CONSOLIDATED Mfg. Co., Toledo, O. "Yale."
(See page 91.)

CROUCH Motor Co., Stoneham, Mass.

CURTISS Mfg. Co., G. H., Hammondsport, N. Y.

DUSENBERG, A. S., Garner, Iowa.

FOWLER-Manson-Sherman Cycle Mfg. Co., 45-47 Fulton St., Chicago, Ill.

GREAT Western Mfg. Co., La Porte, Ind.

Ordinary advertising is
dealer interested comes first.
We have definite digeste
you—either the best dealer in
or attracting dealers generally
it hits the dealer right in his p
We want to tell you abou
our man will call.

THE AUTOMOBILE TR
Flatiron

An increase in the past year of nearly 100% in th
endorsement of the success of our plan.

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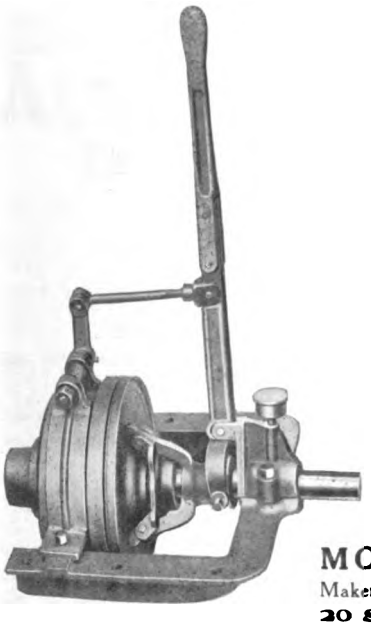

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MARINE

REVERSING GEAR

IS WELL BALANCED
BUILT FOR STRENGTH
AND DURABILITY OF
HIGH GRADE MATERIAL
EASY TO OPERATE
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Makers of Gear, Clutches and other Machine Specialties
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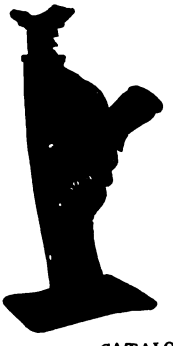
No. 3

This is an illustration of our No. 3 SINGLE ACTING AUTO JACK, made from Malleable Iron, with Steel Rack Bars, therefore specify Leader Jacks and you will not be deceived.



Auto Jacks THAT ARE
Light,
Simple,
Reliable,
Powerful,
Durable.

We also make DOUBLE ACTING JACKS as well.

WRITE US FOR CATALOGUE "A"

Standard Tool Company
432 HARRISON STREET KALAMAZOO, MICH.

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PARTS ANI

ACCESSORIES

DEALERS IN ACCESSORIES

(This is a list of Dealers and Jobbers in Automol Accessories who advertise in this publication.)

ARNSTEIN, Eugene, 35th St. & Shiel Ave., Chicago, Ill.
(See page 79.)

AUTO Accessories Mfg. Co., First & Con gress Sts., Detroit, Mich.
(See page 219.)

AUTOMOBILE Equipment Co., 264 Jef ferson Ave., Detroit, Mich.
(See page 193.)

AUTOMOBILE Supply Co., 1339 Michigan Ave., Chicago, Ill.
(See page opposite.)

BECKLEY-Ralston Co., 80-82-84 Michigan Ave., Chicago, Ill.
(See page 213.)

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo.
(See page opposite.)

EXCELSIOR Supply Co., 233-5-7 Randolph St., Chicago, Ill.
(See page 39.)

FRANCO-American Auto & Supply Co., 1404-6 Michigan Ave., Chicago, Ill.
(See page 113.)

MOTOR Car Supply Co., 1425-27 Michigan Ave., Chicago, Ill.
(See page 107.)

MUTUAL Auto Accessories Co., 1937 Broadway, New York, N. Y.
(See page 241.)

NEUSTADT Auto & Supply Co., St. Louis, Mo.
(See page 207.)

NEW York Sporting Goods Co., 17 Warren St., New York.
(See page 171.)

ACID

BATTERY ACID

(See Electrolyte, Battery)

SOLDERING ACID

(See Flux, Soldering)

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The
AUTOMOBILE SUPPLY CO.
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CHICAGO, ILL.

ENGINES, TRANSMISSIONS, STEERING GEARS, DIFFERENTIALS, WHEELS, FORGINGS and everything else needed by Repairmen. LAMPS, HORNS, TOOLS, TIRES, SPARK COILS, SPARK PLUGS, BATTERIES, CLOTHING, in fact everything used for automobiles.

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Prompt Shipments of Automobile Supplies
Our Specialty
Jobbers—Dealers
Behen-Faught Motor Car Equipment Co.
3061 Olive Street
St. Louis
Mo.

Everything for the Autoist but the Auto

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MONARCH Instrument Co., Cleveland

NORTON Electrical Instrument Co., chester, N. H.

PIGNOLET, Louis M., 78 Cortlandt St. York, N. Y.

QUEEN & Co., Eighth & Arch Sts., adelphia, Pa.

RELIANCE Instrument Co., 60 W. Buren St., Chicago, Ill.

S. E. I. Co., Syracuse, N. Y.

SIMPLEX Co., 60 Nassau St., Newark,

TROY Electrical Co., Troy, N. Y.

TWIN—See Whitney Electrical Instru Co.

WAGNER Electrical Mfg. Co., 6400 Plym Ave., St. Louis, Mo.

WESTERN Electric Co., 259 So. Clinton Chicago.

WESTINGHOUSE Electric & Mfg. Pittsburg, Pa.
(See page 83.)

WESTON Electrical Instrument Co., Wav ly Park, Newark, N. J.

WHITNEY Electrical Instrument Co., Co cord, N. H. "Twin."

WOOD—See Fort Wayne Electric Works.

ANNUNCIATORS

AUTOMOBILE ANNUNCIATORS

(For Signaling from passenger to driver. For Speak ing Tubes—See Tubes, Speaking)

ACME—See Jeseph & Co.

COWLES & Co., C., Water & Chestnut Sts., New Haven, Conn. "Madison Square."

ELECTRIC Signs & Signals Co., 177 1-2 E 87th St., New York, N. Y.
(See page 143.)

JESEPH & Co., W. R., 499 Clinton St., Buffalo, N. Y. "Acme."

JONES Speedometer Co., New Rochelle, N. Y.

MADISON SQUARE—See Cowles & Co.

RUBAY, Leon, 1697 Broadway, New York, N. Y. (Importer).

ASBESTOS

SHEET ASBESTOS

(For Asbestos Packing—See Packing, Asbestos)

ALLIANCE Asbestos Co., Alliance, O.

ASBESTOS Mfg. Co., Philadelphia, Pa.

CAREY Mfg. Co., Philip, Lockland, O.

GILMORE Mfg. Co., R. M., 105 John St., New York, N. Y.

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Asbestos Mfg. Co. 8 Ha
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Ill.
H. F., Erie, Pa

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r Assembled Axles. For Ass
—See Forgings, Drop; also Castings
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S. Ry., Cleveland, O.
N Gear & Mfg. Co., 28 W. S
napolis, Ind.
N Roller Bearing Co., So. Fram
ss.
Auto Co., 2100 E. 9th St.
lo.
ge 49.)
Specialty Co., 1073 Broa
s. O.
hine Co., 911 Orchard St.
lch.
ge 235.)
ND Axle Mfg. Co., Canton, O
S Screw & Machine Co.
St., Columbus, O.
Axle Co., So. Egremont, Mas
R. August, 18-20 E. Water S
he, O.
Chain & Mfg. Co., 231 We
St., Indianapolis, Ind.
ge 65.)
Drive Axle Co., 575 N. Forra
s, O. "Pleukharp."
Machine Parts Co., Elyria, O.
gineering Co., 39-45 14th St.
N. J.
ons Forge & Machine Works, P.
n, N. Y.
Mfg. Co., N. L., 172-8 W.
Columbus, O.
AND—See Webster Mfg. Co.
orter Mfg. Co., Buchanan, Mich.
pring & Axle Co., Jackson, Mich.
m System Co., Lakeside Ave.
N. E., Cleveland, O.
ge opposite.)
Gear Works, 801 E. Charles S
Ind.
FAY Motor & Mfg. Co., Mayhew
Ave. & G. T. R. R., Detroit, Mich.
ge 151.)
HARP—See Direct Drive Axle Co.
Machine & Tool Works, S. 21
t., Plymouth, Pa.
RY Wheel & Mfg. Co., James
N. Y.
ge 233.)
Co., A. O., 241 Clinton St., Mil
e, Wis.
ge 190.)

"LONG-ARM" AUTO-PARTS

QUALITY, QUANTITY, QUICKNESS, COUNT IN PLACING ORDERS.

AXLES—REARS; FULL FLOATING TYPE, SHAFT DRIVE, SINGLE OR DOUBLE BRAKES, QUIET GEARS.
FRONTS; SOLID I BEAM SECTION, PADS FORGED ON.

All Axles with Plain Ball, "F & S" or "H-B" Bearings; 2 Standard Sizes.

CLUTCHES:—CORK INSERT DESIGN, CONE TYPE.

STEERING REACHES:—HIGH CLASS—TUBE TYPE—1, 1½ & 1¾in. BALLS.

ALSO PROPELLOR-SHAFTS, HAND LEVERS, TRANSMISSIONS AND GEAR-CUTTING.

Send for Descriptive Cuts—Quantity Prices.

SAMPLES PROMPTLY FURNISHED TO RESPONSIBLE PARTIES FOR INSPECTION AND TESTS.

SOLD EXCLUSIVELY BY

THE AMERICAN DISTRIBUTING CO.

American Trust Building, CLEVELAND, Ohio

IMPERIAL WHEELS

NOT CHEAPEST—BUT **BEST**

IMPERIAL WHEEL COMPANY

FLINT, MICH.

The American Distributing Co.

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Exclusive Agents

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(Continued)

STANDARD Roller Bearing Co
Lancaster Ave., Philadelphia,

TIMKEN Roller Bearing Axle C

WABASH Gear Works, 10th
Sts., Terre Haute, Ind.

WEBSTER Mfg. Co., 1075 W
Chicago, Ill. "Hedgeland."

WESTON-Mott Co., Hamilton
Aves., Flint, Mich.

BAGS

RUBBER GAS BA

G & J Tire Co., 549 E. Georgi
apolis, Ind.

GOODRICH Co., B. F., Akron, (

MECHANICAL Rubber Co., C.
near Nickel Plate R. R., Clev

TOOL BAGS OR R

(For Tool Boxes—See Boxes

BLIZZARD—See Vehicle Apron

BOYLE & Co., John, 112-14 Du
York, N. Y.

GILBERT Mfg. Co., New H
(See page 267.)

HOPEWELL Bros. & Co., 42
Cambridge, Mass.
(See page 253.)

HUMPHREYS, John, 4038 Payn
Cleveland, O.

REPUBLIC Belting & Supp
W. Third St., Cleveland, O
(See page opposite.)

VEHICLE Apron & Hood Co.,
St., Columbus, O. "Blizzard."

WARNER Pole & Top Co., 1643
Cincinnati, O.

BALLS

STEEL BALLS

AMERICAN Ball-Bearing Co.,

AMERICAN Ball Co., Eagle S
Ave., Providence, R. I.

BUFFALO Excelsior Machine
Road, Buffalo, N. Y.

JONES Co., E. J., Arlington H

STANDARD Roller Bearing Co
Lancaster Ave., Philadelphia,

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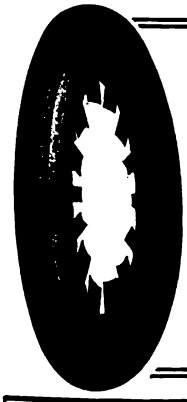
TOOL REPAIR KITS ASSEMBLED TO ORDER
V SHAPED AND FLAT FAN BELTS
THE REPUBLIC BELTING & SUPPLY CO.
CLEVELAND, OHIO
Manufacturers of LEATHER BELTING



WOODWORTH
DETACHABLE TREAD ADJUSTABLE
"SAVES MORE THAN HALF THE TIRE BILL"!
Absolutely Essential to the Economical Running of an Automobile. Shields the Tire against the Dangers of Rough Roads, Hard Usage, Blisters, Bulges, Blow-outs, and against Cuts, Penetrating Moisture and Consequent Rotting of the Fabric. **Prevents Punctures.** Makes the **New** Tire Last Three Times Longer and Adds Many Miles to the Life of the old. Bears the Brunt of Wear, Takes Sure Grip on Smooth or Slippery Roads and **Makes Skidding Impossible. Saves More Than Half the Tire Bill. Positively Does Not Heat the Tire,** but on the Contrary Keeps it Cooler. One style fits all makes of tires. Easy to attach, easy to adjust. Anybody can do it. Our free booklet will tell you all about it. Sizes 26 x 2½ inches to 36 x 5 inches. Prices $8 to $25 each.
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DO NOT Puncture, Skid, Rim-Cut, Blow Out
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DRY BATTERIES (Continued)

AUTOCRAT—See Stackpole Battery Co.

AUTOGAS—See Roche Dry Battery Co.

BEST—See Ampere Mfg. Co.

BLACK HAWK—See Central Electric Mfg. Co.

BLUE RIBBON—See Roche Dry Battery Co.

CENTRAL Electric Mfg. Co., 1525 Second Ave., Rock Island, Ill. "Black Hawk."

COLUMBIA—See National Carbon Co.

CROWN Battery Co., 192 Southern Blvd., New York, N. Y.

DELTA Mfg. Co., Bloomfield, N. J.

DUNN—See Semi-Dry Battery Co.

EASTERN Carbon Works, W. Bergen St., Jersey City, N. J.

ELECTRIC Contract Co., 202 Centre St., N. Y. City.

ELK—See Stackpole Battery Co.

ELKHART Dry Battery Co., Elkhart, Ind.

EMPIRE State Dry Battery Co., 70 Fulton St., N. Y. City. "Red Star." "White Star."

EVER READY—See American Electric Novelty & Mfg. Co.

FRENCH Battery Co., Madison, Wis.

GEEN Electrical Mfg. Co., 180 E. Lake St., Chicago, Ill. "Superior."

H. & H. Dry Battery Co., 842 E. Sample St., South Bend, Ind.

HI PO—See Lincoln Electric Co.

LINCOLN Electric Co., 1-3 Union Sq., N. Y. City. "Hi Po."

LUTZ Co., Geo. A., 439 E. 144th St., New York, N. Y. "S-X."

MANHATTAN Electrical Supply Co., 17 Park Place, New York, N. Y. "Red Seal."

NATIONAL Carbon Co., Cleveland, O. "Red Top," "Columbia."
(See page opposite.)

1900—See Nungesser Electric Battery Co.

NEW STANDARD—See Roche Dry Battery Co.

NUNGESSER Electric Battery Co., 21 King St., Cleveland, O. "Rapid Fire." "1900."

RADIUM—See Stackpole Battery Co.

RAPID FIRE—See Nungesser Electric Battery Co.

RAYFLEX—See Standard Sheet Metal Co.

RED SEAL—See Manhattan Electrical Supply Co.

RED STAR—See Empire State Dry Battery Co.

RED TOP—See National Carbon Co.

ROCHE Dry Battery Co., Wm., 288 Clerk St., Jersey City, N. J. "Autogas." "Blue Ribbon." "New Standard."

ROCK Island Battery Co., Cincinnati, O.

SEMI-DRY Battery Co., 5th & Essex Sts., Harrison, N. J. "Dunn."

STACKPOLE Battery Co., St. Marys, Pa. "Autocrat." "Elk." "Radium." "Wizard."

STANDARD Sheet Metal Co., Delaware Ave., Passaic, N. J. "Rayflex."

SUPERIOR—See Geen Electrical Mfg. Co.

S-X—See Lutz Co.

WESTERN Electric Co., 259 S. Clinton St., Chicago, Ill.

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Over 3,000 miles on well-known Runabout
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STORAGE BATTERIES (Continued)

LOOK Electric Co., 1545 Michigan Ave., Chicago, Ill.

MICHIGAN Storage Battery Co., 24 Atwater St., E., Detroit, Mich. **(See page 37.)**

MORRISON—See Universal Electric Storage Battery Co.

MOUND City Battery Works, 916-24 N. 20th St., St. Louis, Mo.

MULLER, Albert, 205 W. 41st St., N. Y. City. "Porox."

NATIONAL Battery Co., 268-82 Massachusetts Ave., Buffalo, N. Y.

NEW England Motor Co., Liberty Square, Lowell, Mass. "Rex."

NORTHWESTERN Storage Battery Co., 448 Milwaukee St., Milwaukee, Wis.

PHILADELPHIA Storage Battery Co., Emerald & Tioga Sts., Philadelphia, Pa.

POROX—See Muller, Albert.

PORTER—See Evansville Battery & Electrical Co.

RADIUM—See General Accumulator & Battery Co.

REX—See New England Motor Co.

ROYAL Battery Co., 108-10 Duane St., New York, N. Y.

RUBAY, Leon, 1697 Broadway, N. Y. City (Importer). "Lacoste."

SILVEY—See Dayton Mfg. Co.

STORAGE Battery Supply Co., 239 E. 27th St., New York, N. Y.

SYRACUSE Auto Supply Co., 118-20 S. State St., Syracuse, N. Y.

TOLEDO Storage Battery Co., 102-4 Ottawa St., Toledo, O.

TRAY Plate Battery Co., 5 Frederick St., Binghamton, N. Y.

UNITED States Battery Co., New Rochelle, N. Y.

UNIVERSAL Electric Storage Battery Co., Stock Exchange Bldg., Chicago, Ill. "Morrison."

VESTA Accumulator Co., 1336 Michigan Ave., Chicago, Ill.

VIVAX Storage Battery Co., 2234 Michigan Ave., Chicago, Ill. **(See page 37.)**

XLCR—See Excelsior Supply Co.

WESTERN Storage Battery Co., E. 22d & Yandes Sts., Indianapolis, Ind.

WILLARD Storage Battery Co., Cleveland, Ohio.

WITHERBEE Igniter Co., 541 W. 43d St., N. Y. City. **(See page 165.)**

WITHERBEE Mfg. Co., 433 W. 42d St., New York. "Wright-Witherbee."

WRIGHT - WITHERBEE — See Witherbee Mfg. Co.

ZOAR Storage Battery Co., Zoar, O.

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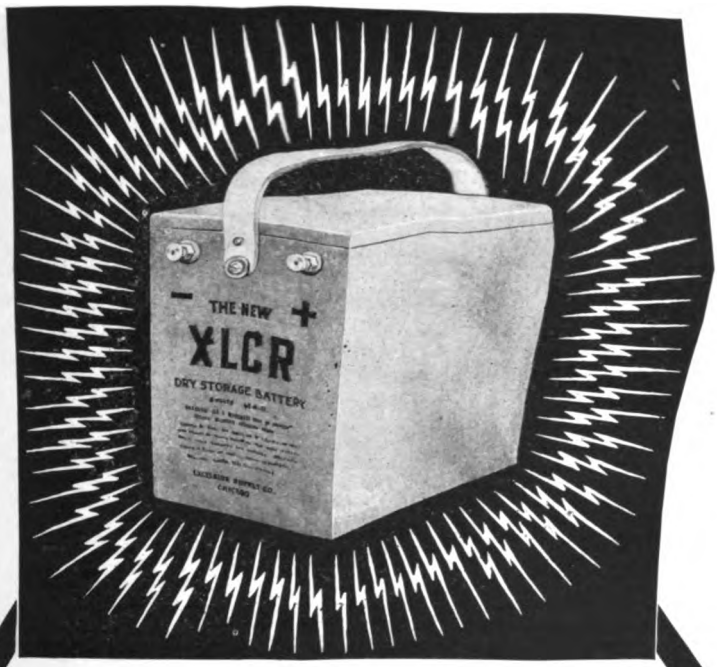

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This NEW XLCR Dry Storage Battery

(Price $26.00)

is made along original lines that give it unique advantages. Its jars are made of the best hard rubber that can be produced—its grids are made of chemically pure lead without alloy—its plates are pasted with pure oxide of lead—its electrolyte is the best that skill and money can make—and the highest technical skill and most painstaking care are used in putting them all together—these are the main reasons why a man who uses the NEW XLCR never has any battery trouble. Our "Battery Booklet TD" tells all about it. We will gladly send it on request.

Excelsior Supply Company

233-235-237 Randolph Street - CHICAGO

Established 1876

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HILL Brass Co., N. N., East Hampton, Conn.

LIBERTY Bell Co., Bristol, Conn.

MOSSBERG Co., Frank, Attleboro, Mass.

NEW Departure Mfg. Co., Bristol, Conn.

BELTING

LEATHER BELTING

AMERICAN Oak Leather Co., Cincinnati, O.

BRADFORD Belting Co., Second & Walnut Sts., Cincinnati, O.

CHICAGO Belting Co., 67 S. Canal St., Chicago, Ill.

GRATON & Knight Mfg. Co., 94-104 Bloomingdale Rd., Worcester, Mass.

HUDSON Belting Co., Worcester, Mass.

JEWELL Belting Co., 15 Trumbull St., Hartford, Conn.

LADEW, Est. of Edward R., 200 William St., New York, N. Y.

NATIONAL Leather Belting Co., 29 Ferry St., New York, N. Y.

NEW York Leather Belting Co., 51 Beekman St., New York, N. Y.

PAGE Belting Co., Concord, N. H.

PROVIDENCE Belting Co., 25 Charles St., Providence, R. I.

RAHMAN & Co., Geo., 6 Ferry St., New York, N. Y.

REPUBLIC Belting & Supply Co., 1616 W. Third St., Cleveland, O. (See page 35.)

SCHIEREN & Co., Chas. A., 30 Ferry St., New York, N. Y.

SHULTZ Belting Co., 402 Bartow St., St. Louis, Mo.

BELTS

SPIRAL WIRE BELTS

(For Driving Fans or Lubricators)

ADWEAR Mfg. Co., N. Attleboro, Mass.

BULL DOG—See New York Wire & Spring Co.

HEBB, Geo. A., 70 William St., Newark, N. J.

HELIX Mfg. Co., Stapleton, N. Y.

LOMBARDI MOTOR Co., 71 Minerva St., Derby, Conn.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (See page 127.)

NEW YORK Wire & Spring Co., Hoboken, N. J. "Bull Dog."

PHILADELPHIA Steel & Wire Co., 525 Commerce St., Philadelphia, Pa. "Powco."

POWCO—See Philadelphia Steel & Wire Co.

SCHOELKOPF Mfg. Co., 1516 Williamson St., Madison, Wis.

AMER Ken (See

DANN Have

SHEP Conn

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WHEE Bridg

AMESB Sts., A

ARMST New H

A-Z Co., (See p

BARND 422 Do (See p

BRIDGE Water

COLE &

DETROI ferson

HAYES Detroit (See pa

KEYSTO

KOEN, J N. Y.

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MIDDLET Conn.

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PENNSYLVANIA Auto Metal Body Mfg. Co., Sinking Springs, Pa.

QUINBY & Co., J. M., 21-39 Division St., Newark, N. J.

SPRINGFIELD Metal Body Co., 387 Birnie Ave., Brightwood, Mass.
(See page 279.)

WOOD & Son, Frederick R., 217 W. 19th St., N. Y. City.

WOOD BODIES

ABRESCH Co., Charles, Fourth & Poplar Sts., Milwaukee, Wis.

ARMSTRONG & Co., M., 433 Chapel St., New Haven, Conn.

AUTO Body Co., Franklin Ave., Lansing, Mich.
(See page 47.)

AUTO Body & Finishing Co., Amesbury, Mass.

AUTO Top & Trimming Co., Pontiac, Mich.

BABCOCK Co., H. H., Watertown, N. Y.

BARNDT-Johnston Auto Supply Co., 422 Donaldson St., Columbus, O.
(See page opposite.)

BEAUDATT Co., O. J., Pontiac, Mich.

BIDDLE & Smart Co., Water St., Amesbury, Mass.
(See page 45.)

BIEHLS Carriage Works, 31 S. Fifth St., Reading, Pa.

BLUE Ribbon Horse & Carriage Co., 130-70 Cannon St., Bridgeport, Conn.

BORBEIN Auto Co., 2109 N. 9th St., St. Louis, Mo.
(See page 49.)

BORCHERS Tonneau Mfg. Co., Dayton, O.

BRIDGEPORT Vehicle Co., South Ave. & Water St., Bridgeport, Conn.

BRIGGS Carriage Co., Cedar St., Amesbury, Mass.

BROC Carriage & Wagon Co., E. 40th St. & Payne Ave., Cleveland, O.

BRUNN'S Carriage Manufactory, 1140-48 Main St., Buffalo, N. Y.

BUFFALO Auto Body & Trimming Co., 338 Ellicott St., Buffalo, N. Y.

BUOB & Scheu, 408-10 E. Court St., Cincinnati, O.

CARLISLE Body & Gear Co., North West & Lincoln Sts., Carlisle, Pa.

CARRIAGE Woodstock Co., Owensboro, Ky.

CENTRAL Body Co., Connersville, Ind.

CHICAGO Coach & Carriage Co., 1223 Michigan Ave., Chicago, Ill.

COLE & Woop, 48 W. 67th St., New York, N. Y.

CURRIER-Cameron Co., 85 Elm St., Amesbury, Mass.

CUTTER, J. Frank, 414 Main St., Cambridge, Mass.

DANN Bros. & Co., 80-88 Franklin St., New Haven, Conn.

DAYTON Folding Tonneau Co., Dayton, O.

DEMOREST, A. L., New Haven, Conn.

DETROIT Carriage Co., Detroit, Mich.

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LOCKE &
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MOORE &
York, N. Y

MOUNT &
St., Red B

NEW HAVI
Conn.
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NICHOLS &
St., Boston

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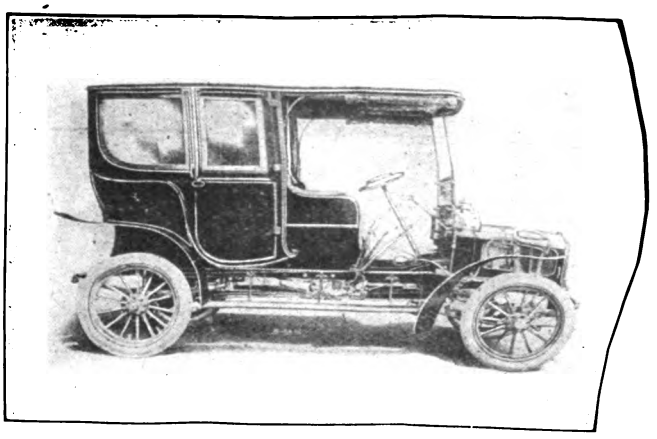
LIMOUSINES



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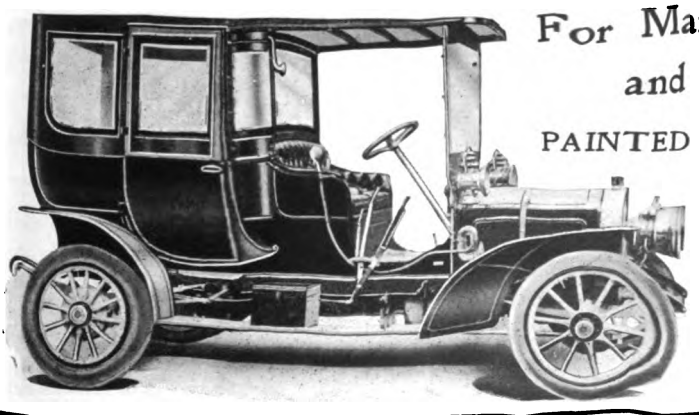

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OHIO Carriage Body Co., Bellefontaine, O.

PEASE & Sons, S. C., Main St., Merrimac, Mass.

PETZELT & Keyser, 24th & Locust Sts., Philadelphia, Pa.

PONTIAC Body Co., Pontiac, Mich.

QUINBY & Co., J. M., 21-39 Division St., Newark, N. J.

QUINSLER & Co., 26-30 Cambria St., Boston, Mass.

RACINE Novelty Mfg. Co., 15th & Clark Sts., Racine, Wis.

RECH & Sons, Jacob, 8th St. & Girard Ave., Philadelphia, Pa.

RITTER Mfg. Co., 63 Amsterdam Ave., Detroit, Mich.

ROBBINS & Co., Irvin, 32 E. Georgia St., Indianapolis, Ind.

ROTHSCHILD & Co., 530 W. 27th St., New York, N. Y.

SAFETY Buggy Co., Lancaster, Pa.

SCHUBERT Bros. Gear Co., 42-44 Cedar St., Oneida, N. Y.

SCHURMEIER Wagon Co., 29 Western Ave., Minneapolis, Minn.

SEABROOK & Smith Carriage Co., 126 Park St., New Haven, Conn.

SHIELDS Carriage Co., Amesbury, Mass.

STEWART & Co., Hugh, 414 Main St., Cambridgeport, Mass.

STEWART Co., W. F., Hamilton & Industrial Aves., Flint, Mich.

STIVERS, R. M., 19 W. 62d St., New York.

STONE & Sons, C., 167-77 Ogden Ave., Chicago, Ill.

STRATTON Carriage Co., C. H., Muncie Ind.

STUDEBAKER Bros. Mfg. Co., 378 Wabash Ave., Chicago, Ill.

TERRE Haute Carriage & Body Co., 101 Wabash Ave., Terre Haute, Ind.

THOMPSON Co., E. J., 5917-19 Penn Ave., Pittsburg, Pa.

UNION City Body Co., Union City, Ind.

WALKER Carriage Co., Merrimac, Mass.

WILCOX, M. E., Providence, R. I.

WILLOUGHBY Co., 86 Genesee St., Utica, N. Y.

WILSON Body Co., C. R., Detroit, Mich.

WOGAMAN, J. Webster, Union City, Ind.

WOOD & Son, Frederick R., 217 W. 19th St., New York, N. Y.

YORK Wagon Gear Co., York, Pa.

YOUNG Carriage Co., Wm., 4524 Delmar Ave., St. Louis, Mo.

ZIMMERMANN & Sons, F. F., Main St., Waupun, Wis.

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Oswego,

STICKNE

WALKER
isville, K

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AMERICAN
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ATLAS Bo
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GARLAND
Bldg., Pit

HARTFORD
Capital A
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KIRK-Latty
N. Y. C. &

LAMSON &
Ave., Cleve

MICHIGAN
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MOORE Co.,

NATIONAL
Ave., S. E.

NIAGARA S
N. Y.

PENINSULA
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REED & P
Worcester,

REPUBLIC
Bldg., Chic

RUSSELL, B
Port Chest

UNION Steel

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Ohio.

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St., Worcest

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(For enclosing steering connections and universal joints)

GILBERT Mfg. Co., New Haven, Conn. (See page 267.)

STEVENS & Co., Chas. L., 139 Beaubein St., Detroit, Mich.

BOWS

TOP BOWS

BROWN & Co., S. N., Dayton, O. (See page opposite.)

DANN Bros. & Co., 80-88 Franklin St., New Haven, Conn.

SPRAGUE Umbrella Co., Norwalk, O.

UNION Bow Co., 419 Superior Ave., S. W., Cleveland, O.

WHEEL & Wood Bending Co., 141 John St., Bridgeport, Conn.

BOXES

METAL BATTERY BOXES

A-Z Co., 527 W. 56th St., New York, N. Y. (See page 177.)

DETROIT Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (See page 49.)

HAYES Mfg. Co., 360-70 Maybury Ave., Detroit, Mich. (See page 111.)

KINSEY Mfg. Co., 1126 E. 3d St., Dayton, O. "Kinwood."

KINWOOD—See Kinsey Mfg. Co.

MULLINS Co., W. H., 124 Franklin St., Salem, O.

NOYE Mfg. Co., 50 Lakeview Ave., Buffalo, N. Y.

OHIO Blower Co., 330 Prospect Ave., N. W., Cleveland, O.

WOOD BATTERY BOXES

CHURCHILL Cabinet Co., 72-76 Churchill St., Chicago, Ill.

JACKSON Mfg. Co., 614 17th St., Denver, Colo.

RACINE Novelty Mfg. Co., 15th & Clark Sts., Racine, Wis.

RUTLAND Motor Specialty Co., 74 West St., Rutland, Vt.

WEST Box Co., F. M., 225 Liberty St., Springfield, Mass.

AUTO B Mich. (See p

CHURCI St., Ch

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MURRA

RACINE Racine

WEST Springf

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AVERY Ave., C (See p

A-Z Co., (See p

BRISCOE Newarl (See p

DETROI Greenw (See pa

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RACINE Racine.

WEST B Springfi

ADJUST

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KELLY H Clevelan

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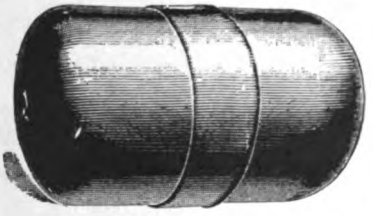

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AUTOMOBILE BOWS

S. N. BROWN & CO.

DAYTON, OHIO

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ADJUSTABLE AND AUTOMATIC LAMP BRACKETS (Continued)

NORTHWAY, Thomas J., 102 Exchange St., Rochester, N. Y. "Rochester." **(See page 105.)**

PYLE Mfg. Co., 2211 Park Ave., Indianapolis, Ind.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

ROCHESTER—See Northway, Thomas J.

STATIONARY LAMP BRACKETS

AMERICAN Motor Parts Co., 21-23-25 Plymouth Court, Chicago, Ill.

CENTURY Specialty Co., 1079 S. Bruck St., Columbus, O.

CROSBY Co., Buffalo, N. Y. **(See page 83.)**

CURRY & Abeles, 229 Mulberry St., Newark, N. J. **(See page 109.)**

DOUGLAS & Lomason Co., 302 Grand River Ave., Detroit, Mich.

FINDEISEN & Kropf Mfg. Co., 21st & Rockwell Sts., Chicago, Ill.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. **(See page opposite.)**

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

IMPERIAL Brass Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill. **(See page 57.)**

KONIGSLOW Mfg. Co., Otto, Cleveland, O. **(See page opposite.)**

OHIO Brass Co., Mansfield, O.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SMITH & Co., Jos. N., 154-62 4th St., Detroit, Mich. **(See page 223.)**

STANDARD Welding Co., Cleveland, O.

BRAKES

AIR BRAKES

KALISCH Air Brake Co., 106 Locust St., St. Louis, Mo.

WATRES Mfg. Co., 1133 Broadway, New York, N. Y.

EXPANDING AND CONTRACTING BRAKES

GARFORD Co., Elyria, O.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. **(See page opposite.)**

KONIGSLOW Mfg. Co., Otto, Cleveland, O. **(See page opposite.)**

LONG Arm System Co., Cleveland, O. **(See page 33.)**

MOON A
Detroit

MUNCIE
Muncie

RAYMO

ROYAL
Bridge

SMITH
Milwa
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New Y

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PERFEC

PHILAD
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DETROIT
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RANDOLP

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SCOVILL

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ACCURATE MACHINING OF CASTINGS AND FORGINGS
SHEET METAL STAMPING OF EVERY DESCRIPTION
EXHAUST HEADERS, INTAKE PIPES AND SPECIAL FITTINGS
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Do You Know

that any kind of auto motor can be hung in our pressed steel and angle iron frame running gears

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We make automobile parts to order, from your drawings, the way you want them—sometimes better than you want them. We're the automobile builder's auxiliary plant—his annex. We produce parts that are commonly neglected—parts no one else wants to make—and we make them well. Our plant is large, on a high economical basis, and we save the part-maker's profit—particularly on Brakes, Brake-Bands, Brake-Drums, Ball-Races, Connecting-Rods, Gaskets, Hub-Caps, Hub-Flanges, Tank-Heads, Sectors, Special Machine Work and Stampings in general. Our imperfections are made right for the cost of a two-cent stamp. We're specialists on delivering the day promised.

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MADISON Woolen Co., Madison, Me.

SLATER & Sons Woolen Mill, Webster, Mass.

WATERLOO Woolen Co., Waterloo, N. Y.

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(For cleaning garage floors)

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DEAN & Co., Henry E., 180 Austin St., Worcester, Mass.

MINERVA—See American Wire Brush Co.

OSBORN Mfg. Co., 5401 Hamilton Ave., N. E., Cleveland, O.

BRUSHES

CARBON MOTOR BRUSHES

AMERICAN Carbon & Battery Co., East St. Louis, Ill.

EASTERN Carbon Works, Carbon Pl., Jersey City, N. J.

NATIONAL Carbon Co., Cleveland, O. (See page 37.)

SPEER Carbon Co., St. Marys, Pa.

SPARK PLUG BRUSHES

OSBORN Mfg. Co., 5401 Hamilton Ave., N. E., Cleveland, O.

PRESCO—See Press Mfg. Co.

PRESS Mfg. Co., 6006 Olive Court, Cleveland, O. "Presco."

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ABERCROMBIE & Fitch Co., 57 Reade St., N. Y. City.

DUPLEX Folding Pail Co., 420 West 14th St., New York City.

GOODRICH Co., B. F., Akron, O.

GOODYEAR Rubber Co., 787 Broadway, New York, N. Y.

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MECH.

PARKI York.

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APPLIA Blvd.,

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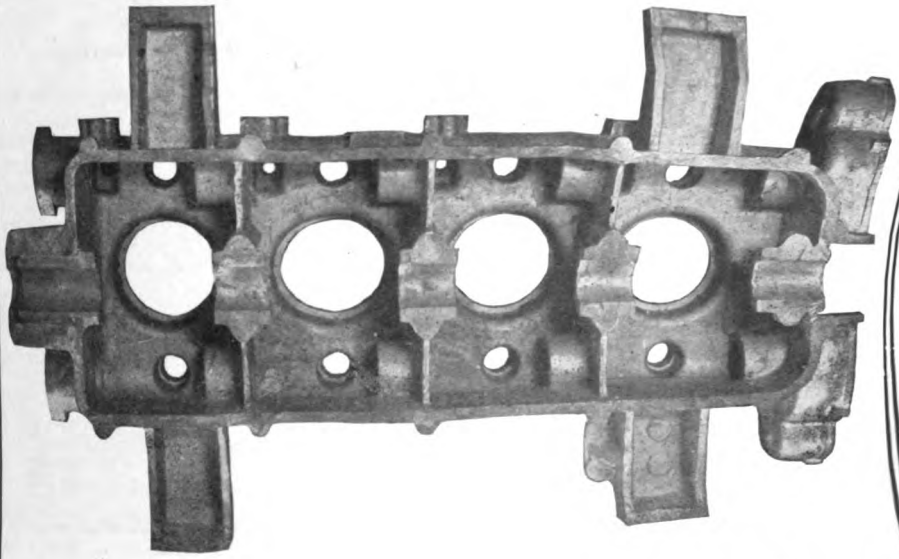

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CRANE Co., W. N., 1131-33 Broadway, New New York, N. Y. "Bray."

CRESCENT—See Kirchberger & Co.

DOLAN—See Steward Mfg. Co.

KIRCHBERGER & Co., 50 Warren St., New York, N. Y. "Crescent." "Von Schwarz."

STEWARD Mfg. Co., D. M., Chattanooga, Tenn. "Dolan."

VON SCHWARZ—See Kirchberger & Co.

GASOLINE AND KEROSENE BURNERS
(For steam boilers)

BRANCH—See National Equipment Co.

FORG, Peter, 50 Park St., Somerville, Mass.

LIGHTNING—See Walker Co.

KELLY Handle Bar Co., 5017 Perkins Ave., Cleveland, O.

NATIONAL—See Thompson Mfg. Co.

NATIONAL Equipment Co., Holland Bldg., St. Louis, Mo. "Branch."

OFELDT & Sons, August, 123 Liberty St., New York.

OFELDT & Sons, F. W., Nyack-on-the-Hudson, N. Y.

STEAM Carriage Boiler Co., 119 W. First St., Oswego, N. Y.

THOMPSON Mfg. Co., Judson L., Waltham, Mass. "National."

WALKER Co., E. C., 1913-23 Logan St., Louisville, Ky. "Lightning."

BUTTONS

UPHOLSTERY BUTTONS

ATLAS Tack Co., 113 Chambers St., New York, N. Y.

CINCINNATI Cloth Button Co., Cincinnati, Ohio.

COWLES & Co., C., New Haven, Conn.

CRANDALL-Stone Co., Binghamton, N. Y.

METAL Stamping Co., 243 West St., New York, N. Y.

NEW Haven Button Co., New Haven, Conn.

READE, Chas. W., 103 Court St., New Haven, Conn.

TOCKWOTTON Co., 79 S. Main St., Providence, R. I.

CABLE

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(See Rope, Bronze Wire; also Rope, Steel Wire)

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AMER port,
AUTM N. Y
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DOVE Ave.,
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KNAP N. Y.
McCLI P. R.
MAPL "Hov
NEW 10th
NOER Conn.
OIL RI
UNIVE Lam
VOGE Brook
WILSO Chica

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WASTE CANS (Continued)

DOVER Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

IRON Clad Mfg. Co., 204 Varet St., Brooklyn, N. Y.

LYON Metallic Mfg. Co., Aurora, Ill.

McCLINTOCK & Irvine, Neville St. & P. R. R., Pittsburg, Pa.

WILSON & Co., F. Cortez, 239 Lake St., Chicago, Ill.

CAPS

HUB CAPS

(Pressed or Stamped Caps. For Cast Caps—See Castings)

AVERY Stamping Co., 5209 Lakeside Ave., Cleveland, O. (See page 47.)

BOSTON Pressed Metal Co., 171-73 Union St., Worcester, Mass.

BOWEN Mfg. Co., 16 Canal St., Auburn, N. Y.

CROSBY Co., Buffalo, N. Y. (See page 83.)

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (See page 49.)

HARTFORD Machine Screw Co., Hartford, Conn. (See page 261.)

KONIGSLOW Mfg. Co., Otto, Cleveland, O. (See page 49.)

STANDARD Welding Co., Cleveland, O.

WORCESTER Pressed Steel Co., Greendale, Mass.

MOTORISTS' CAPS

ADLER Bros., 1566 Broadway, New York, N. Y.

DEMMERLE & Co., 248 W. 23d St., New York City.

DETROIT Cap Mfg. Co., 11-17 Woodbridge St., W., Detroit, Mich.

DINNER Co., Isaac H., 78 Bedford St., Boston, Mass.

KIBBE, C. S., Batavia, N. Y.

LASKY & Levy, 2 Astor Place, New York, N. Y.

LILLEY Co., M. C., Columbus, O.

MORAWETZ Co., 343 Broadway, Milwaukee, Wis.

PONTIAC Knitting Co., Pontiac, Mich.

REVILLON Freres, 19 W. 34th St., New York, N. Y.

SAKS & Co., Broadway & 33d St., N. Y. City.

SCANDINAVIAN Fur & Leather Co., 16 W. 33d St., N. Y. City.

SHAW, Ora D., 109 Kingston St., Boston, Mass.

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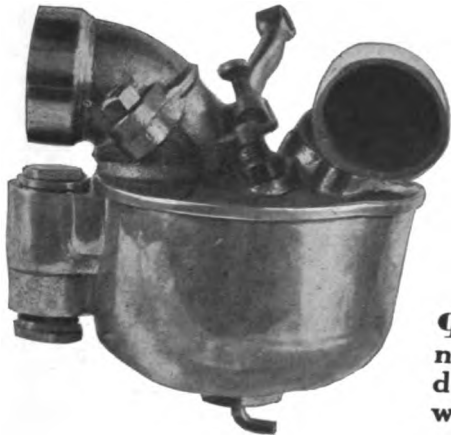

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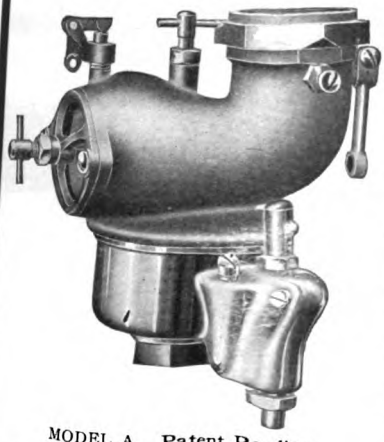

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GASOLINE CARBURETERS
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DEMSTER Machinery Co., 16th & Walnut Sts., Kansas City, Mo. "Brooke."

DUPLEX Roller Bushing Co., Belfast, Me. "Leinau."

EVER READY—See Auto Improvement Co.

FAST, Otto, Greenfield & 25th Aves., Milwaukee, Wis.

GAITHER-Owen Co., 40 W. 60th St., N. Y. City.

GALVIN Co., J. F., 74-78 Fort St., E., Detroit, Mich.

GARLLUS—See Winkley Co.

GAVELEK—See Lustre Chemical Co.

GENERATOR Valve Co., 294-96 Taaffe Place, Brooklyn, N. Y.

GOLDBERG Motor Car Devices Mfg. Co., 1252 Michigan Ave., Chicago, Ill.

HAGAR Carburettor Co., 819-21 Broadway, Nashville, Tenn.

HALL Co., Chas. E., 108 Broadway, Buffalo, N. Y. (See page 251.)

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (See page 5.)

HEITGER Carbureter Co., 205-7 West South St., Indianapolis, Ind. (See page 55.)

HOLLEY Bros. Co., 661-73 Beaubein St., Detroit, Mich.

IMPERIAL Brass Mfg. Co., 241-49 So. Jefferson St., Chicago, Ill. (See page 57.)

KALAMAZOO Carbureter Co., 1301 Grand Ave., Kalamazoo, Mich.

KAUFMAN, Chas., 28 Main St., Oshkosh, Wis.

KINGSTON—See Byrne, Kingston & Co.

KNOX—See Camden Anchor-Rockland Machine Co.

LEINAU—See Duplex Roller Bushing Co.

LOOMIS Autocar Co., Westfield, Mass.

LUSTRE Chemical Co., 1303 Michigan Ave., Chicago, Ill. "Gavelek."

MARVEL Mfg. Co., Lock Box 41, Indianapolis, Ind. "Red Valve." (See page 55.)

MAYER Carbureter Co., 2673 Main St., Buffalo, N. Y.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. (See page 127.)

MORGAN, B., Newport, R. I.

NEWCOMB Carbureter Co., 1900 Broadway, N. Y. City.

NIAGARA SPRAY—See Steinbrenner & Co.

NORTH Chicago Machine Co., North Chicago, Ill. "Palmbla." (See page 69.)

NUTTING Machine Co., Dayton, O. "Nu Zent."

NU ZENT—See Nutting Machine Co.

OLD NICK—See Pioneer Brass Works.

PALMBLA—See North Chicago Machine Co.

PIONEER Br "Old Nick."

POWER Co., son, Wis.

PUTNAM Mc Springfield.

RED VALVE-

RUTENBER-

SARIS, J. H.,

SCHEBLER-

SCIENTIFIC-

SHAIN, Chas N. Y. "Bal

SHERWOOD Belt Line, I

SPEED Cha Washingto "Universal (See page

STANDARD Mathewson (See page

STEINBREN Buffalo, N.

STEVENS C "Scientific."

TORREY, W Mass. "Alc

TURNER B (See page

UNIVERSAL Co.

WESTERN "Rutenber (See page

WHEELER "Schebler."

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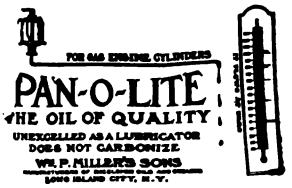

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Once used **PAN-O-LITE OIL** becomes an inseparable part of the autoist's equipment. The reason: a simple one; **PAN-O-LITE OIL** possesses a combination of qualities unapproached by any other oil on the market.

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Manufacturers
73-79 Third St. Long Island City, N. Y.
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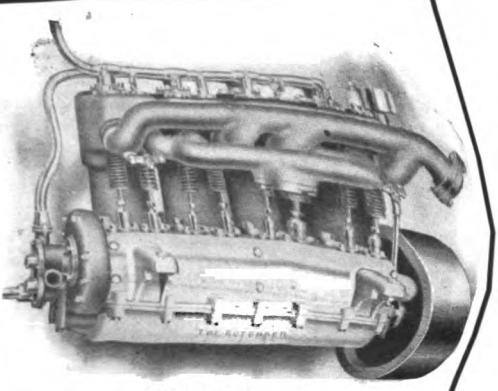

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1908 30 to 60 H. P. MODELS

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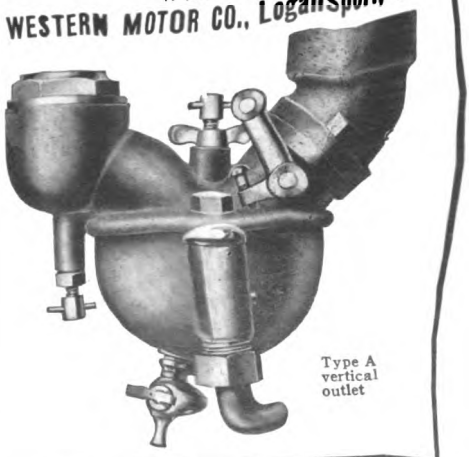

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CARD AND TOILET CASES

COWLES & Co., C., Chestnut & Water Sts., New Haven, Conn.

PARRY & Co., A. N., Amesbury, Mass.

WHITE Mfg. Co., 155 Cannon St., Bridgeport, Conn.

MAGNETO CASES

(See Covers, Leather Magneto)

MEDICAL EMERGENCY CASES

ABBEY & Co., P. L., Kalamazoo, Mich.

UNITED States Emergency Case Co., Utica, N. Y.

SPARK COIL CASES

(See Boxes, Spark Coil)

SPARK PLUG CASES

(Leather case for holding spare plugs)

GILBERT Mfg. Co., New Haven, Conn. (See page 267.)

HOPEWELL Bros. & Co., 42 Osborn St., Cambridge, Mass. (See page 253.)

HUMPHREYS, John, 4038 Payne Ave., N. E., Cleveland, O.

NATHAN Novelty Mfg. Co., 88-90 Reade St., New York, N. Y.

TIRE AND TUBE CASES

(For covering spare tires and tubes)

ALLEN Auto Specialty Co., 1931 Broadway, N. Y. City.

BLIZZARD—See Vehicle Apron & Hood Co.

BURGIN Bros., Springfield, Mass. "Eureka."

EMPIRE Automobile Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

EUREKA—See Burgin Bros.

FICKLING & Co., 154 E. 57th St., New York, N. Y.

GILBERT Mfg. Co., New Haven, Conn. (See page 267.)

HOPEWELL Bros., 42 Osborn St., Cambridge, Mass. (See page 253.)

HUMPHREYS, John, 4038 Payne Ave., N. E., Cleveland, O.

JENKINS Specialty Mfg. Co., 37 N. Main St., Sumter, S. C.

KIMBALL Tire Case Co., 171 Broadway, Council Bluffs, Ia.

NATHAN Novelty Mfg. Co., 88-90 Reade St., N. Y. City.

NEW YORK Square, N.

NOLAN, W Mass.

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TEEL Mfg. C

VEHICLE A St., Colum

WILEY & S Hartford, C

WINSHIP, V Mass.

(See

ALUMINU

ALLEN Mfg. cago, Ill.

ALLYNE Br O., Detroit (See page

ALUMINUM

AMERICAN Fulton & olis, Ind. (See page

AMERICAN & T. Bldg.,

AMERICAN Herbert St

AMERICAN

AMESBURY bury, Mas (See page

ATLAS Bra St., Colum (See page

BLAKE, Ed ford, Conn.

BELFIELD Philadelphi

BRASS Fou Adams St.,

BRIDGEPOR Co., Bridge

BUCKEYE I St., Dayto

CHAPMAN Springfield,

CHICAGO I Chicago, Il

CITY Brass N. E., Clev

CLARK, Joh

CLUM & At N. Y.

COLUMBUS

CRAMP & Wm., Bea

DAY Found falo, N. Y.

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ALUMINUM, BRONZE AND BRASS CASTINGS (Continued)

DELTA—See Phosphor Bronze Smelting Co.

ELEPHANT—See Phosphor Bronze Smelting Co.

ELKHART Brass Mfg. Co., 908 Prospect St., Elkhart, Ind.

ELM CITY Brass Co., New Haven, Conn.

ELYRIA Machine Parts Co., Elyria, O.

ENTERPRISE Foundry Co., Detroit, Mich.

EUREKA Tempered Copper Works, Northeast, Pa.

FINDEISEN & Kropf Mfg. Co., 21st & Rockwell Sts., Chicago, Ill.

FOREST City Brass Works, Cleveland, O.

FOSTORIA Aluminum Co., Fostoria, O.

FRIES & Co., 91 Main St., Buffalo, N. Y.

GALVIN Co., J. F., 74-78 Fort St., E., Detroit, Mich.

GAYLORD Co., F. L., 28 Pleasant St., Ansonia, Conn.

GERSON-Carey Co., Kalamazoo St. & L. S. Ry., Lansing, Mich.

GRAHAM & Co., James, 293 Wooster St., New Haven, Conn.

HENDRYX & Co., Andrew B., New Haven, Conn.

HERCULES Float Works, 200 Franklin St., Springfield, Mass.

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

HOMER Brass Works, 231 Race St., Philadelphia, Pa.

HUB Foundry & Plating Co., Ossining, N. Y.

IMPERIAL BRASS Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill.
(See page 57.)

INDIANA Brass & Bronze Co., Marion, Ind.

JEFFERSON Brass Foundry, Brooklyn, N. Y.

KEYLESS Lock Co., Indianapolis, Ind.

KEYSTONE Brass Foundry Co., 188 Berks St., Philadelphia, Pa.

KOKOMO Brass Works, 351 N. Smith St., Kokomo, Ind.

LANGSENKAMP - Wheeler Brass Works, 1206-28 Shelby St., Indianapolis, Ind.

LIGHT Mfg. & Foundry Co., Union & Queen Sts., Pottstown, Pa.
(See page 59.)

LUMEN Bearing Co., Lathrop St., Buffalo, N. Y.
(See page 149.)

MANHATTAN Brass Co., 328 E. 28th St., N. Y. City.

MAYO Damper Co., 355 Walnut St., Pottstown, Pa.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 127.)

NEW JERSEY Aluminum Co., 701 Springfield Ave., Newark, N. J.
(See page 159.)

NIAGARA Falls Brass Works, Niagara & Virginia Sts., Buffalo, N. Y.
(See page 51.)

NOLTE Brass Co., Springfield, O.

NORWALK Brass Co., Mechanic St., Norwalk, Conn.

OBERDORFER Brass Co., M. L., 804 East Water St., Syracuse, N. Y.

OHIO

PHOSI Was "Ele (See

PIONE

PITTS Ave.,

POWO

PROVI Co., 4

REEVE Philac

RYAN Chica

SHERW Ave.,

SHERW Line.

SPENCI

STAND

STOVEI

STROMI Roches

SYRACU 530 Le (See fi

TURNEI (See p

UNIQUE N. Y.

UNITED Pa.

UNITED Hamilt

UNITED Road. C

WESTER St., Chi

WILLIAM St., Cin

WILLIAM Jersey C

WOODRU Carmel.

AMERICA ware St.

FRANKLI

SPACKE Ave. & (See pag

GR

ACME Fou O.

AMERICAN Herbert

ATLAS Fo ton St., (See pag

BARCUS &

BARLOW ark, N. J.

BELLE CI Wis.

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SUCH AS

ALUMINUM, BRASS

AND

Parsons Manganese Bronze

must be made the ALLYNE WAY, for the ALLYNE WAY means

Quality, Reliability and Dependability

to say nothing of promptness in shipments.

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If you have some difficult or heavy patterns that you have experienced difficulties in getting castings off, write us.

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GRAY IRON CASTINGS (Continued)

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BUFFALO Foundry Co., Buffalo, N. Y.

CAPITOL Foundry Co., Hartford, Conn.

CHICAGO Hardware Foundry Co., North Chicago, Ill.

CRAMP & Sons' Ship & Engine Building Co., Wm., Beach & Ball Sts., Philadelphia, Pa.

DETROIT Stoker & Foundry Co., No. Grand Blvd. & Riopelle St., Detroit, Mich.

DOMESTIC Sewing Machine Co., Warren & High Sts., Newark, N. J.

DUPLEX Roller Bushing Co., Belfast, Me.

ENTERPRISE Foundry Co., Detroit, Mich.

ERIE Foundry Co., Erie, Pa.

FERRO Machine & Foundry Co., 251 Wade Building, Cleveland, O. (See page 243.)

FULTON Foundry & Machine Co., 25 Furman St., Brooklyn, N. Y.

GREY Iron Castings Co., Mt. Joy, Pa.

HART Foundry Co., 10 Allen St., Lawrence, Mass.

HAYES Foundry Co., Lynn, Mass.

HOPSON & Chapin Mfg. Co., New London, Conn.

INDIANAPOLIS Foundry Co., Indianapolis, Ind.

INTER-State Foundry Co., Sheridan St., Cleveland, O.

Andrews Co., 1st National Bank Bldg., Chicago, Ill.

MANUFACTURERS' Foundry Co., Waterbury, Conn. (See page opposite.)

MASSEY Machine Co., Watertown, N. Y.

MEEKER Foundry Co., 95 Clay St., Newark, N. J.

MILLER & Jones Co., Wilmington, Del.

MOORE Co., Franklin, Winsted, Conn.

NATIONAL Sewing Machine Co., Belvidere, Ill.

NORTMANN-Duffke Foundry Co., 26th & Layton Aves., Milwaukee, Wis.

PALMER & De Mooy Foundry Co., Leonard & Winter Sts., Cleveland, O.

PARKHURST Mfg. Co., Peru, Ind.

PHILADELPHIA Stove & Iron Foundry Co., 1631 N. Fifth St., Philadelphia, Pa.

SESSIONS Foundry Co., Farmington Ave., Bristol, Conn.

SPENCER'S Sons, I. S., Guilford, Conn.

STANDARD Foundry & Mfg. Co., 2717 E. 75th St., Cleveland, O.

STOVER Mfg. Co., Freeport, Ill.

STOWELL Mfg. & Foundry Co., So. Milwaukee, Wis.

SUSQUEHANNA Casting Co., Wrightsville, Pa.

TARRANT Foundry Co., 36-66 Indiana St., Chicago, Ill.

THREE Rivers Furnace & Foundry Co., Three Rivers, Mich.

UTICA Foundry Co., Utica, N. Y.

WALKER Foundry Co., Erie, Pa.

WES St.,
WIL Mic
MA
ACMI Mili
ARCA ton
BARL ark,
BEAV Dam
BRIDC port,
BUHL
COLUI
DAYT
FLAGC
FRAZI
GLOBI Syra
ILLIN Blvd.
JOHNS N. Y.
MALLI Conn.
MEEKI N. J.
MESTA
MOLIN
NAUGA tuck,
NORWA
OSHKO
RACINE Racine
RHODE Grove.
SOUTH Windl
SPRING field, C
SYRACU N. Y.
TERRE Haute.
WILMIN ton, De

ACME S Military
ADRIAN
AMERICA
ARCADE ton Sq.,
ATHA St
BETHLEI
BUFFALC ington S

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You know that you can not afford to experiment with cylinders from a foundry unfamiliar with this class of work. You don't have to when you can take advantage of our years of experience, our superior equipment, and our "know how."

The largest foundry in the country especially devoted to **CYLINDERS.** New additions, making capacity double that of last year. The leading automobile manufacturers as customers, and an output of over 63,000 cylinders annually. We are satisfying others. Can do the same for you. Try us.

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Waterbury, Conn.

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CHESTER Steel Castings Co., Chester, Pa.

CHICAGO Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill.

CHROME Steel Works, Chrome, N. J.

CRUCIBLE Steel Casting Co., Lansdowne, Pa.

CRUCIBLE Steel Castings Co., Milwaukee, Wis.

DUTCHER Co., 640-80 Kinnikinnic Ave., Milwaukee, Wis.

FEDERAL Steel Foundry Co., Chester, Pa.

FLAGG & Co., Stanley G., Philadelphia, Pa.

FORT Pitt Steel Casting Co., McKeesport, Pa.

JOHNSON & Co., Isaac G., Spuyten Duyvil, N. Y. City.

KEYSTONE Steel Casting Co., Chester, Pa.

LOGAN Mfg. Co., Phoenixville, Pa.

MACKINTOSH, Hemphill & Co., Pittsburg, Pa.

MALLEABLE Iron Fittings Co., Branford, Conn.

MASSACHUSETTS Steel Casting Co., West Everett, Mass.

MESTA Machine Co., Pittsburg, Pa.

MICHIGAN Crucible Steel Castings Co., 249 Guion St., Detroit, Mich. (See page 53.)

MILWAUKEE Steel Foundry Co., South Water & Virginia Sts., Milwaukee, Wis.

NEW England Steel Castings Co., Hyde Park, Mass.

NEWARK Iron & Steel Co., Newark, O.

NEW JERSEY Steel Co., Rahway, N. J.

NEW Process Steel Co., Marshall, Mich.

NORTMANN-Duffke Foundry Co., 26th & Layton Aves., Milwaukee, Wis.

NORWAY Iron & Steel Co., York, Pa.

OTIS Steel Co., 3131 Lakeside Ave., N. E., Cleveland, O.

REED Mfg. Co., Kalamazoo, Mich. (See page 53.)

RIPPEL Steel Foundry Co., E. G., 31-39 Indiana St., Buffalo, N. Y.

RIVERSIDE Steel Casting Co., 451-573 Riverside Ave., Newark, N. J.

SHARON Foundry Co., Sharon, Pa.

SMITH Steel Castings Co., Geo. H., 500 Clinton St., Milwaukee, Wis.

TAYLOR Iron & Steel Co., High Bridge, N. Y.

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WHITELEY Steel Co., 108½ Jefferson St., Muncie, Ind.

WILMINGTON Malleable Iron Co., Wilmington, Del.

WORCESTER Steel Foundry Co., Millbury, Mass.

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M. & M
MORG
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N. Y.
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TINGLI
TRENT
N. J.
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YOUNG,
Ave.,
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On Your Chain Orders and Forget Your Chain Troubles

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MILLER, Chas. E., 97 Reade St., N. Y. City. (Importer). "Brampton."

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PEUGEOT Freres, 296 Broadway, New York, N. Y. (Importers).

RENOLD—See Link Belt Co.

WHITNEY Mfg. Co., Hartford, Conn.

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DEFIANCE Chain Co., 143 Federal St., Boston, Mass.

GAYLOR, L. B., 43 N. Beacon St., Allston, Mass.

JOHNSON Sporting Goods Co., Iver, 163-65 Washington St., Boston, Mass.

SAGER Co., J. H., 265 South Ave., Rochester, N. Y.

WEED Chain Tire Grip Co., 28 Moore St., N. Y. City. (See cover.)

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(See Frames, Pressed Steel)

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HOSE CLAMPS

CLANCY, J. R., 247 N. Selina St., Syracuse, N. Y. "Redfield." "Sure Grip."

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (See page 49.)

METAL Stamping Co., 243 West St., New York, N. Y.

MORGAN, B., Newport, R. I.

PERFECT—See Philadelphia Auto Accessories Co.

PHILADELPHIA Auto Accessories Co., Odd Fellows Temple, Philadelphia, Pa. "Perfect."

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REDFIELD—See Clancy, J. R.

STAR—See Phoenix Hardware Mfg. Co.

SHERMAN Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich.

SURE GRIP—See Clancy, J. R.

AUTO N. Y

EMER Broa

AMERI 308 F Read

BELFI Phila

CHELS ton, M (See

EVER Novel

INGERS Lane,

JONES N. Y.

LEVY & City.

NEWMA cago,

NORWI

SAFETY

WILSON St., Ph

CARR, F (Deale (See pa

CHASE (ton, Ma (See pa

FAIRFIE

HODGMA York, N

LAIDLAV St., Nev (See pa

LANDERS ton, Ma (See pa

MUTTY C Mass. (I (See pa

NATIONA

WESTERN

UI

(See Bro

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THE "CHELSEA" AUTO CLOCK

(TRADE MARK)

BEST IN THE WORLD

¶ Clocks built with a view to stand the jars and jolts and rough riding of Automobiles. Reputation the highest. Used by parties demanding the BEST

PRICE LIST

In "Special" Cases (Design of Case Patented Dec. 19, 1905)		In "Round" Cases	
2¾ inch "Special" Auto Clock,	$36	2¾ inch Auto Clock,	$26
3½ inch "Special" Auto Clock,	$45	3½ inch Auto Clock,	$28
3½ inch "Special" Motor Clock,	$41	3½ inch Motor Clock,	$24

Wood Stands, if wanted by Dealers, viz.: for showing two clocks, $2.00; for showing one clock, $1.50

Sizes stated are the approximate diameters of the dials.

Above illustration shows in reduced size the 2¾ inch "SPECIAL" Auto Clock and 3½ inch (Round Cased) MOTOR Clock. The sizes are the approximate diameters of the dials. All are in Duplex (Patent applied for) Polished Cast Brass Cases, the most thoroughly waterproof case on the market. The "SPECIALS" show dial on angle; its clock when removed from outer (locked) case, is excellent for use on mantels, bureaus, etc.; very convenient when touring. Outer case secured to dashboard by hidden screws. The 3½ inch MOTOR Clock is a strong, reliable clock, but the AUTO Clocks have a somewhat finer train. You want the BEST? Ask for the "CHELSEA."

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BISHOP & Co., J. H., Wyandotte, Mich.

BOYNTON'S Improved Pioneer Oil Clothing Co., Vincent St., Gloucester, Mass.

BROOKS Bros., 22d St. & Broadway, New York, N. Y.

CHICAGO Auto Robe Supply Co., 155-59 Market St., Chicago, Ill.

CROSBY Frisian Fur Co., 116 Mill St., Rochester, N. Y.

DEMMERLE & Co., 248 W. 23d St., N. Y. City.

ENTERPRISE Rubber Co., 110 Federal St., Boston, Mass.

FULLER & Sullivan, 19 Elliott St., Boston, Mass.

GILBERT Mfg. Co., New Haven, Conn. (See page 267.)

GUNTHER'S Sons, G. C., 184 Fifth Ave., New York, N. Y.

HODGMAN Rubber Co., 806 Broadway, N. Y. City.

MACULLAR-Parker Co., 400 Washington St., Boston, Mass.

MILFORD Auto Coat Co., Milford, Mass.

MOORE-Smith Co., Winthrop Sq., Boston, Mass.

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NEW York Leather Coat Co., 207 Greene St., N. Y. City.

OUR Own Mfg. Co., 568-74 Broadway, New York, N. Y.

PIONEER Woolen Mills, 1020-40 Beaufait St., Detroit, Mich.

RAINO Co., 735 S. Halsted St., Chicago, Ill.

REVILLON Freres, 19 W. 34th St., New York, N. Y.

RICHARDSONS, 338 Washington St., Boston, Mass.

ROGERS, Peet & Co., 258 Broadway, N. Y. City.

RUSZITS Fur Co., John, 69-73 E. 11th St., N. Y. City.

SCANDINAVIAN Fur & Leather Co., 16 W. 33d St., New York, N. Y.

SEABOARD Rubber Co., 278 Pearl St., New York City.

SHUMAN & Co., A., Boston, Mass.

SMITH, Crary & Davidge, 174 Water St., Binghamton, N. Y.

SPEAR-Martin Fur Co., 41 Church St., Burlington, Vt. "Adirondack."

SPRAGUE Co., F. H., Orange, Mass.

STALL & Dean Mfg. Co., 23 Foundry St., Brockton, Mass.

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WALLAC St., Det

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AKRON

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DOUBLE St., Ch

FORT W

GENERA ald Sts

HATCHI Clevel (See p

HAYDE St., Co

KONIGS O. (See p

LONG A 38th S (See p

MOTOR gress (See p

MUNCI Munci

NORTH cago, (See

NORTH Mayb (See p

PALMB

SMITH wauk (See

STAND New

STURT ton, M

UNIVE Phila

VERST ton S

WARN Chica

WARN (See

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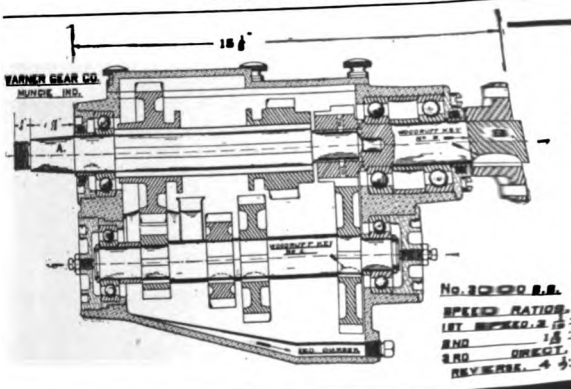

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DIFFERENTIALS
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CONTROL LEVERS

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For Automobile Engines
Have you tried the new composition?
WRITE US
THE STANDARD WELDING CO.
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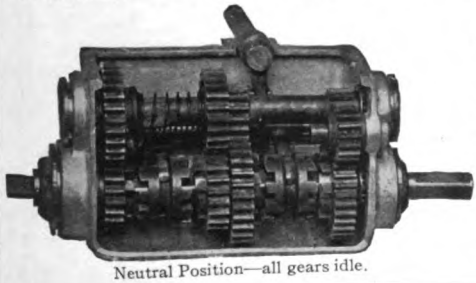
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Selective Type
Three Speeds Forward and the Reverse

The speed change gears are always in mesh and the engagement for any of the speeds is made through the heavy jaw clutches which makes the transmission strong, durable and perfect in control.

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THERE IS A REASON
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NORTH CHICAGO, ILL.

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(See Clothing, Motorists')

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SPRING KEY COCKS

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IMPERIAL Brass Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill. (See page 57.)

LUNKENHEIMER Co., Beekman & Waverly Sts., Cincinnati, O.

POWELL Co., Wm., 2125 Spring Grove Ave., Cincinnati, O.

WILLIAMS Valve Co., D. T., Cincinnati, O.

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BELFIELD & Co., H., Philadelphia, Pa.

BELKNAP Mfg. Co., Bridgeport, Conn.

BUCKEYE Iron & Brass Works, 324 E. Third St., Dayton, O.

CRANE Co., 519 S. Canal St., Chicago, Ill.

DETROIT Brass Works, 1304 Brooklyn Ave., Detroit, Mich.

EAGLE Brass Works, Dubois & Franklin Sts., Detroit, Mich.

ESSEX Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

GLOBE Brass Works, 15-17 Macomb St., Detroit, Mich.

HAYDENVILLE Co., Haydenville, Mass.

HOMER Brass Works, 231 Race St., Philadelphia, Pa.

IMPERIAL Brass Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill. (See page 57.)

JARECKI Mfg. Co., Erie, Pa.

KELLY & Jones Co., Greensburg, Pa.

LUNKENHEIMER Co., Beekman & Waverly Sts., Cincinnati, O.

McNAB & Harlin Mfg. Co., 56 John St., New York, N. Y.

McRAE & Roberts Co., 227-35 Campbell Ave., Detroit, Mich.

MICHIGAN Lubricator Co., 661-73 Beaubien St., Detroit, Mich.

NOLTE Brass Co., Springfield, O.

POWELL Co., Wm., 2125 Spring Grove Ave., Cincinnati, O.

QUEEN City Brass & Iron Works, Spring Grove Ave., Cincinnati, O.

REGESTER'S Sons Co., J., Holliday & Saratoga Sts., Baltimore, Md.

ROBERTS Brass Mfg. Co., Detroit, Mich.

SCHAEFFER & Budenberg Mfg. Co., Foxboro, Mass.

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TURNER
(See pa

WILLIAM

NATIONA
Conn.

STANDAI
Conn.

WHITLO
Conn.
(See pa

AMERICA
Foxboro

AMERICA
Wharf,
(See pa

APPLE—S

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CAPITOL

CONNECT
Meriden,

DAYTON
St., Day
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York, N.

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Syracuse

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Four Cylinder Coil with Switch Interchangeable Units.

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Produce the CATERPILLAR FLAME

Positively the only coil made that can not be broken down in secondary winding on high voltage.

Every unit is an X Ray coil, perfect in action and practical for X Ray photography.

Equipped with the most rapid vibrator ever used. One adjustment, and low current consumption. These are a few of our claims, and manufacturers should not fail to investigate them before closing their contracts. We could interest you more by quoting prices.

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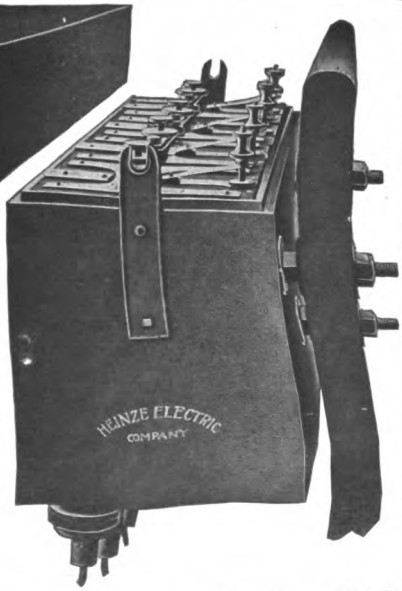
Heinze Four Cylinder Auto Spark Coil



We are the Largest Coil Manufacturers in the Country, making from one to four cylinder dash board coils, and all kinds of high and low tension coils.

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REMY Electric Co., Anderson, Ind.

RUBAY, Leon, 1697 Broadway, New York N. Y. (Importer). "Lacoste."

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(See page 203.)

SEIDLER-Miner Electric Co., 205-9 Jefferson Ave., Detroit, Mich.
(See page 95.)

SHERMAN-Lemke Coil & Supply Co., 102 Wisconsin St., Milwaukee, Wis.

SPLITDORF, C. F., 261-65 Walton Ave., New York, N. Y.
(See page opposite.)

THORDARSON Electric Mfg. Co., 153 S. Jefferson St., Chicago, Ill.

TRITT Electric Co., 301 S. Division St., Union City, Ind. "Rapid Fire." "Veribest."

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WILLIAMS, E. Q., 535-39 S. Clinton St., Syracuse, N. Y.

WILLYOUNG Appliance Co., Ludlow Station, Yonkers, N. Y.
(See page 141.)

COLORS

COACH COLORS

(See Paints and Colors)

COLUMNS

WATER COLUMNS AND BOILER ALARMS

KITTS Mfg. Co., 111-15 Water St., Oswego, N. Y.

LOCKE Regulator Co., 76 North St., Salem, Mass.

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COMMUTATORS

SPARK COMMUTATORS

(See Timers, Ignition)

C(

ANTI-FRI

ALGER Labor

ARCTIC—See

AUTO Chemic
New York, N

BADGER Mfg
Wis. "Milw

CARBONDALI
Pa.

KALBFLEISC
St. & Broad
(See page

MARX & Ra
City.

MILWAUKEE-
Co.

YOUNG, Orlan
Ave., Newar
(See page 2

BRAZI

A. & J. Mfg.
cago, Ill.

CAST Iron
N. H.
(See page 2

CORTLAND S
Cortland, N.

DIXON Crucib
mouth Sts.,
(See page 10

KREMBS & Co

SCHNEIDER,
ark, N. J.

STANDARD B
ton, Mass.

STANDARD L
St. Chicago, I

TURNER Bras
(See page 2

CASE HARI

ALTEMUS & C

HOUGHTON &

MOSSO, C. A.,

ROGERS & Hul

CYLIN
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GENERAL Acc
Second St.,
Decarbonizer."

RADIATO

BADGER Mfg.
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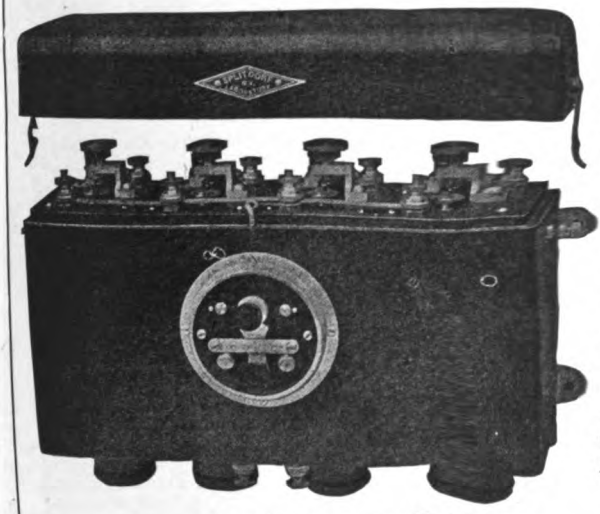

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This proves their superiority.

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PITTSFIELD COILS

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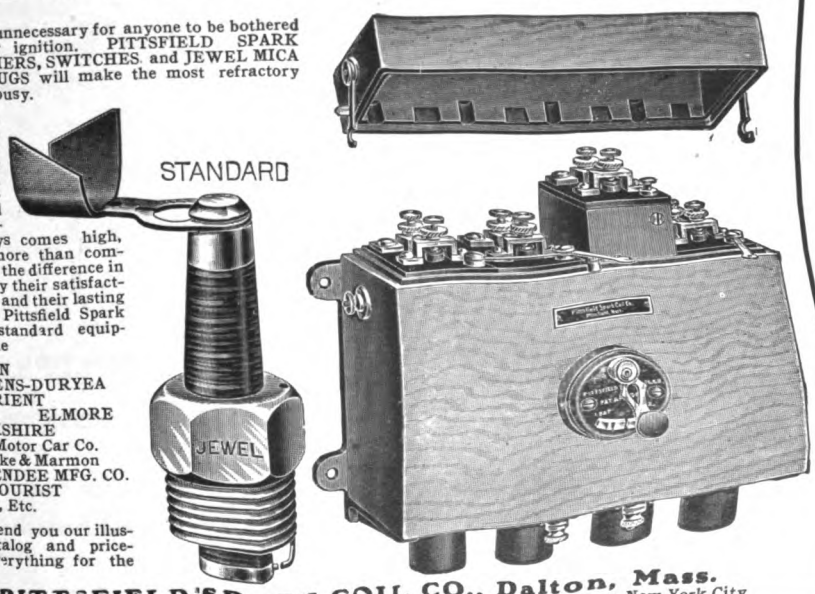
Let us send you our illustrated catalog and price-list of everything for the ignition.



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ESSEX Mfg. & Supply Co., Newark, N. J. "Rapidcut."

EUREKA—See Auto Equipment Co.

GRINDAM Mfg. Co., Albany, N. Y.

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CORTLAND Welding Compound Co., Cortland, N. Y.

CONDENSERS

STEAM CONDENSERS

LONG-Turney Mfg. Co., Rome, N. Y.

NATIONAL Oil Burner & Equipment Co., Holland Bldg., St. Louis, Mo.

WALKER Co., E. C., 1913-23 Logan St., Louisville, Ky.

WHITLOCK Coil Pipe Co., Hartford, Conn.
(See page 179.)

CONES

BALL CONES

(See Cups, Ball)

CONNECTIONS

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CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

ECLAIR—See Rubay, Leon.

EVERTIGHT—See Smith Bros.

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SMITH Br

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troit, Mi

BRIGGS, V
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HERZ & C
N. Y.

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Mfg. Co.

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MILLS—Se

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ton St., C

GENERAL

LINCOLN
Ave., N.

**WESTING
Pittsbur
(See pa**

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ATLAS CYLINDER CASTINGS

AUTOMOBILE MOTOR
MARINE MOTOR
STATIONARY ENGINE
AIR BRAKE

GRAY IRON and SEMI-STEEL CYLINDER CASTINGS

OUR BUSINESS is making the very best cylinder castings that can be produced. Unequalled facilities and 16 years' practical experience qualify us to meet the most exacting demands. We know how to make, and do make, the most difficult and complicated castings true to pattern, clean, soft, tough and close grained. Let us quote you on GOOD CASTINGS—they cost no more than inferior work made by ordinary foundries.

ATLAS FOUNDRY COMPANY

PEORIA, ILL.

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COOLERS

WATER COOLERS

(See Radiators, Water Cooling)

COPPER

SHEET AND ROD COPPER

(See Brass, Sheet)

TUBE COPPER

(See Tubing, Brass)

CORK

BRAKE AND CLUTCH INSERTS

NATIONAL Brake & Clutch Co., 16 State St., Boston, Mass. (See page 27.)

COUPLINGS

HOSE COUPLINGS

(See Clamps, Hose)

PIPE COUPLINGS

(See Fittings, Pipe)

COVERS

AUTOMOBILE COVERS

(For covering automobiles when in the garage)

AMERICAN Karbel Co., Jonesboro, Ark.

BURGIN Bros., Springfield, Mass.

DUANE & Co., W. J., 304 W. 54th St., N. Y. City.

FICKLING & Co., 154 E. 57th St., New York, N. Y.

GILBERT Mfg. Co., New Haven, Conn. (See page 267.)

HOLCOMB Co., 105 Goffe St., New Haven, Conn.

PARIS Auto Top Co., 236 W. 41st St., N. Y. City.

VEHICLE Apron & Hood Co., Columbus, O.

WILEY & Son Co., Wm. H., 1217 Main St., Hartford, Conn.

I

ALLEN Auto
N. Y. City.

BLIZZARD—

BRIDGEPOR
Water St., I

EMPIRE Rub
York, N. Y.

FICKLING &
City.

GIFFORD &
N. Y. City.

**GILBERT M
(See page**

JENKINS Sp
Sumter, S.

**LONDON Aut
Ave., Chica
(See page**

NATHAN No
N. Y. City.

NEW York M
N. Y. City.

VEHICLE Ap
St., Columb

**VEHICLE T
Ave., St. L
(See page**

WILEY & So
Hartford, C

OI

BAY State S
Worcester,

BENNETT—

BOWEN Mfg
N. Y.

HANDY—See

**TUCKER, W
(See page**

WINKLEY
Mich.

MA

DENTZEAU,
York, N. Y.

STARTI

(See

STEERIN

(S

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TUCKER OIL HOLE COVERS

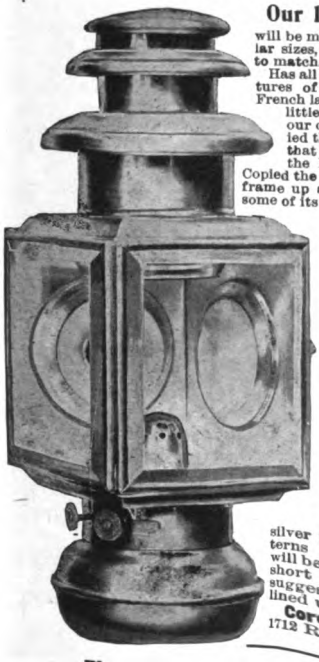
OIL-TIGHT and DUST PROOF

THE KIND THAT STANDS VIBRATION

Send for Catalog of Full Line

W. H. & C. F. TUCKER, Hartford, Conn.

CORCORAN'S FRENCH SQUARE OIL SIDE LAMP



Our 1907 Leader

will be made in two popular sizes, with Tail Lights to match.

Has all the desirable features of the high-priced French lamps, with a few little improvements of our own. Yes, we copied the French lamps that were shown at the New York Show. Copied the style and general frame up and improved on some of its weak points, and now CORCORAN is "IT" on square lamps if anybody should ask you. These French lamps were being priced at as high as $70.00 per pair at the New York Show, and we haven't got the nerve to ask $10.00 per pair. (We have an awfully low price—write.)

Elegant, well made, highly finished, and out of good, heavy-gauge brass. Solid brass outside, silver inside. Our patterns for these lamps will be finished in a very short time and would suggest that you get lined up for samples.

Corcoran Lamp Co.
1712 Reading Road
Cincinnati, Ohio

'B'-LINE OIL GREASE GUNS

The Handy Gun for Unhandy Places

Handles equally well gasoline oil or heavy g ase

It is the only high grade Oil Gun known

It is all Metal inside and out

IT OPERATES WITH ONE HAND
It is guaranteed a full year against everything but abuse

Write for Dealers' Discounts

RANDALL-FAICHNEY CO. BOSTON MASS.

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CRANES

PORTABLE CRANES, HOISTS AND CHAIN BLOCKS

ACME—See Moore Co., Franklin.

CHISHOLM & Moore Mfg. Co., Cleveland, O. "Cyclone."

CYCLONE—See Chisholm & Moore Mfg. Co.

DALE Engine Supply Co., Franklin, Pa.

DOBBIE Foundry & Machine Co., Niagara Falls, N. Y.

FRANKLIN Portable Crane & Hoist Co., Franklin, Pa.

HARRINGTON, Son & Co., Edward, Philadelphia, Pa. "Peerless."

HERCULES—See Nicholls, Wm. S.

MOORE Co., Franklin, Winsted, Conn. "Acme."

NICHOLLS, Wm. S., 253 Broadway, New York, N. Y. "Hercules."

NILES-Bement-Pond Co., New York, N. Y.

PEERLESS—See Harrington, Son & Co.

ROUND & Son, D., Broadway & Marble St., Cleveland, O.

YALE & Towne Mfg. Co., 9 Murray St., New York, N. Y.

CRANKSHAFTS

FINISHED OR MACHINED CRANKSHAFTS

(For Crankshafts in the rough—See Forgings, Drop)

AMERICAN & British Mfg. Co., Bridgeport, Conn.

ANDERSON Forge & Machine Co., 21-31 St. Aubin Ave., Detroit, Mich. (See page opposite.)

ATLAS Mfg. Co., 87 Wood St., Fostoria, O.

AUTO Crank Shaft Co., 793-97 Gratiot Ave., Detroit, Mich.

CARPENTER Steel Co., Reading, Pa.

CHESTER Forging & Engineering Co., Broad & Crosby Sts., Chester, Pa.

DRIGGS-Seabury Ordnance Corp., Sharon, Pa.

ELLSWORTH, J. M., 518 W. 22d St., New York, N. Y. (See page 155.)

ERIE Forge Co., Erie, Pa.

FUNK Engineering Co., 39-45 14th St., Hoboken, N. J.

GILL & Sons Forge & Machine Works, P. H., Brooklyn, N. Y.

LELAND & Co., W. H., 1025 Southbridge St., Worcester, Mass.

NATIONAL Engineering Co., Saginaw, Mich.

NORTON Grinding Co., Worcester, Mass.

OBENBERGER Co., John, 220 Lake St., Milwaukee, Wis.

STANDARD Connecting Rod Co., Beaver Falls, Pa. (See page 185.)

TINDEL-MORRIS Co., Eddystone, Pa.

METAL

BRIDGEPOR Conn.

DIXON Cruc mouth Sts. (See page

McCULLOUG burg, Pa.

SEIDEL, B. delphia, Pa

TAUNTON C

WATERBUR Conn.

WISCONSIN Stevens Po

BALL

BOSTON Pr St., Worce

CHICAGO S cago, Ill.

CORBIN Sc Conn.

DETROIT S (See page

GLOBE Mac ilton Ave. (See page

HARTFORD Capitol A (See page

KONIGSLOV O. (See page

NATIONAL

PENINSULA vue Ave.

REESE Mac Main St.

WESTERN Elyria, O.

WORCESTE Mass.

OIL

ACORN Bra Chicago, I

AMERICAN

AMERICAN Detroit, M

BAY State Worcester,

BESLY & St., Chica

BOWEN M N. Y. "E

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Drop Forgings

FOR AUTOMOBILE AND MACHINERY MANUFACTURERS

TRADE DA MARK

We also manufacture STEAM HAMMER FORGED

High Grade CRANK SHAFTS

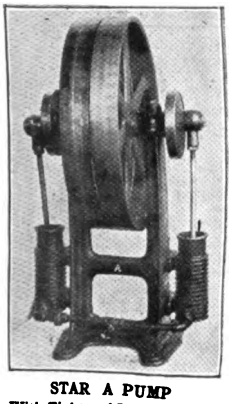
Either Rough Forgings or Completely Machined

Anderson Forge & Machine Co.

No. 18 St. AUBIN AVENUE DETROIT, MICH.

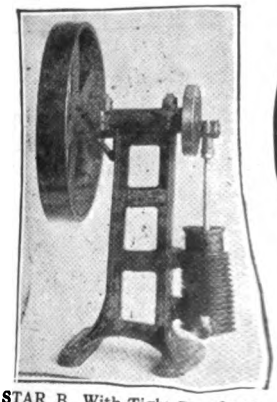
THE HITS OF THE SEASON

OUR STAR PUMPS are built to stand all kinds of hard usage, as all bearings can be tightened and taken up at any time; crank pins are all hardened and will wear a lifetime. Our low price on these pumps is no criterion of the quality.



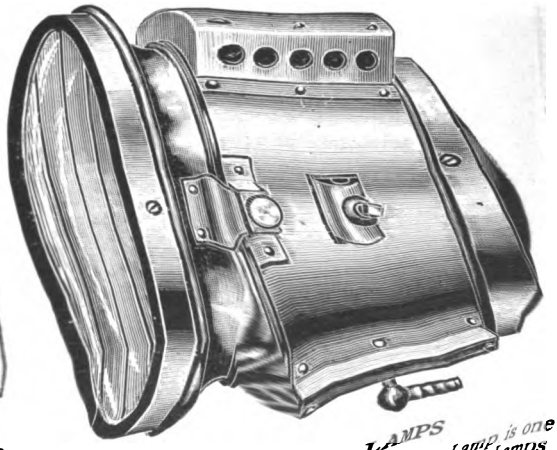
STAR A PUMP
With Tight and Loose Pulleys

This pump has two cylinders 2 7-16 with a 5-inch stroke and has a capacity of pumping up to 200 pounds pressure in tank of 120 gallons per hour at 125 R. P. M. It is made like our Style B Pump. Only has two cylinders. This pump is to be desired where a big volume of air is needed.



STAR B, With Tight Pulley or Tight and Loose Pulley

This pump is made like a gas engine, using two steel rings on piston cylinder and piston ground to fit; has a pumping capacity of 125 pounds at 125 R. P. M. in 80-gallon tank in 40 minutes. This pump will last a lifetime as it has nothing to wear or get out of order. Cylinder is 2 7-16 and stroke 5 inches.



CENT[illegible]RY LAMPS

Century No. 77 R[illegible]shmore Type Lamp is one of the many popula[illegible] styles of Century Lamps which scored phenor[illegible]enal success at the late Automobile Show he[illegible]d in Chicago.

Write for our com[illegible]plete and up-to-date Automobile Accessory Cat[illegible]alogue.

EUGENE ARNSTEIN, 35th Street and Shields Avenue, CH[illegible]ICAGO, U. S. A.

Exclusive Distributers of Century Lamps and Star Power Pu[illegible]mps

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OIL AND GREASE CUPS (Continued

BUCKEYE Iron & Brass Works, 324 E. Thir St., Dayton, O.

CRANE Co., 519 S. Canal St., Chicago, Ill.

CROWN—See Winkley Co.

DETROIT Lubricator Co., Lincoln Ave. & G. T. R. R., Detroit, Mich.

EMPRESS—See Bowen Mfg. Co.

ERIE Stamping & Mfg. Co., Erie, Pa.

ESSEX Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

KELLY & Jones Co., Greensburg, Pa.

LUNKENHEIMER Co., 213-23 E. 8th St., Cincinnati, O.

MICHIGAN Lubricator Co., 661-73 Beaubein St., Detroit, Mich.

MOGUL—See Powell Co.

PENBERTHY Injector Co., 360 Holden Ave., Detroit, Mich.

POWELL Co., Wm., 2125 Spring Grove Ave., Cincinnati, O. "Mogul," "Signal."

SHERMAN Mfg. Co., H. B., 12 Barney St., Boston, Mass.

SHERWOOD Mfg. Co., Elmwood Ave. & Belt Line, Buffalo, N. Y.

SIGNAL—See Powell Co.

STAR Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

TUCKER, W. H. & C. F., Hartford, Conn. (See page 77.)

TURNER Brass Works, Sycamore, Ill. (See page 205.)

WILLIAMS Valve Co., D. T., 521-23 Hunt St., Cincinnati, O.

WINKLEY Co., 226 Abbott St., Detroit, Mich. "Crown."

SPRING KEY PRIMING CUPS

For Ordinary Priming Cups—See Cocks, Standard P2)

ESSEX Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

IMPERIAL Brass Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill. (See page 57.)

LUNKENHEIMER Co., 213-23 E. 8th St., Cincinnati, O.

POWELL Co., Wm., 2125 Spring Grove Ave., Cincinnati, O.

WILLIAMS Valve Co., D. T., 521-23 Hunt St., Cincinnati, O.

CUSHIONS

SPECIAL SEAT CUSHIONS

(For Ordinary Cushions—See Bodies; also Tops)

PNEUMATIC Mfg. Co., 3 South St., N. Y. City.

VENTILATED Cushion & Spring Co., Jackson, Mich.

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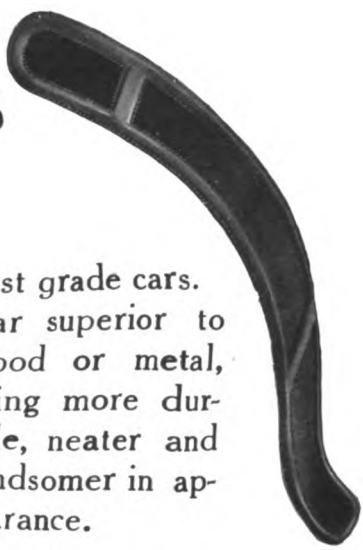
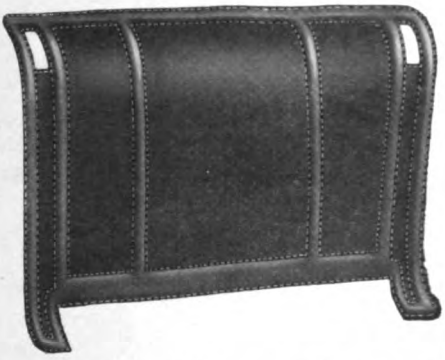
Leather Dashes and Fenders



The kind that are used on the highest grade cars.



Far superior to wood or metal, being more durable, neater and handsomer in appearance.

LICENSE PADS

Pads that will not curl up and get out of shape. Made of a light, strong steel frame and covered with leather, neatly stitched.

ORDERS FILLED PROMPTLY

McKinnon Dash Co.,

BLACK ROCK STATION,
BUFFALO, N. Y.

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CARBURETTER FLOAT DRESSING

(Substitute for shellac for coating cork floats)

BERTOLET, Dr. John M., Reading, Pa.

LEATHER TOP DRESSING

BUFFALO Specialty Co., 375-77 Ellicott St., Buffalo, N. Y. "Peerless."

JEWELL Mfg. Co., 914 Marshall Blvd., Chicago, Ill.

PEERLESS—See Buffalo Specialty Co.

WEST Mfg. Co., 119 N. Madison St., Rockford, Ill.

DRILLS

PORTABLE DRILLS AND POLISHERS

CHICAGO Pneumatic Tool Co., 1010 Fisher Bldg., Chicago, Ill. "Duntley."

CINCINNATI Electric Tool Co., 650-52 Evans St., Cincinnati, O.

CLARK, Jr., & Co., James, Louisville, Ky. Conn.

COATES Clipper Mfg. Co., Worcester, Mass.
(See page 133.)

DUNTLEY—See Chicago Pneumatic Tool Co.

HISEY-Wolf Machine Co., Cincinnati, O.

STOW Flexible Shaft Co., 26th & Callowhill Sts., Philadelphia, Pa.

U. S. Electrical Tool Co., Cincinnati, O.

WILLEY—See Clark, Jr., & Co.

DRUMS

PRESSED STEEL BRAKE DRUMS

(For Cast Drums—see Castings)

AVERY Stamping Co., 5209 Lakeside Ave., Cleveland, O.
(See page 47.)

BOSTON Pressed Metal Co., 171-73 Union St., Worcester, Mass.

CROSBY Co., Buffalo, N. Y.
(See page opposite.)

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O.
(See page 49.)

HYDRAULIC Pressed Steel Co., Cleveland, O.
(See cover.)

KEIM Mills, John R., Liberty St. & Kensington Ave., Buffalo, N. Y.

KONIGSLOW Mfg. Co., Otto, Cleveland, O.
(See page 49.)

PARISH &
Ave., Cl
(See pag

SMITH Co
waukee,
(See pag

WORCEST
Mass.

MC

BATTER
AND

ALLIS-Ch
BRUCE-M
C. & C. El
CROCKER
ECK Dyna
ELWELL-
St., Clev
EMERSON
ENGINEE
St., New
FAIRBAN
Franklin
FISHER I
Detroit.
FORT Wa
Ind.
GENERAL
HOLTZER
Mass.
LINCOLN
Ave., N.
NATIONA
Clinton
PEERLES
PHOENIX
ROTH Br
cago, Ill.
SPRAGUE
New Yo
TRIUMPH
Cincinna
WESTERN
WESTING
Pittsbur
(See pa

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WESTINGHOUSE
Automobile Motors

Our Lines of pleasure vehicle motors differ from those for business wagons, each line being designed with special reference to the work for which they are intended.

Circular 1059 gives particulars

Westinghouse Electric & Mfg. Co.

Sales Offices in all Large Cities — Pittsburg, Pa.
Selling Agents: American Distributing Co., American Trust Building, Cleveland, Ohio

STAMPED STEEL STEP HANGER

You have been waiting for it.

Handsome—Light—Strong

Made in a number of different lengths and drop. The new style head of this hanger makes possible the very strongest method of attaching the frame.

Write for Samples or Blueprints.

PATENTED MARCH 5, 1907.

THE CROSBY COMPANY, Buffalo, N. Y.

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EJECTORS

STEAM EJECTORS

(For filling tanks on steam cars)

EAGLE—See Sherwood Mfg. Co.

LOCKE Regulator Co., 76 North St
Mass.

PENBERTHY Injector Co., 360 Hol
Detroit, Mich.

SHERWOOD Mfg. Co., Elmwood
Belt Line, Buffalo, N. Y. "Eagle.

ELBOWS

PIPE ELBOWS

(See Fittings, Pipe)

ELECTROLYTE

STORAGE BATTERY ELE
LYTE

**KALBFLEISCH Co., Franklin F
way & 16th St., New York, N.
(See page opposite.)**

ELEVATORS

GARAGE ELEVATO

BREWER, Elias, 42 Sudbury S
Mass.

BRODESSER Elevator Mfg. Co.,
Well Sts., Milwaukee, Wis.

COHOES Iron Foundry & Machi
hoes, N. Y.

EATON & Prince Co., 76 Michig
cago, Ill.

HOUGHTON Elevator & Machin
S. Huron St., Toledo, O.

HOYT Elevator Co., 129 Pearl
Mass.

KIECKHEFER Elevator Co.,
St. Paul Ave., Milwaukee, Wis

MOLINE Elevator Co., Moline, I

OTIS Elevator Co., Railway Ex
cago, Ill.

PARKHURST Mfg. Co., Peru, I

REEDY Co., H. J., 11-15 W.
Cincinnati, O.

REEDY Elevator Mfg. Co., J. V
St., Chicago, Ill.

SEDGWICK Machine Works, 1
N. Y.

STORM Mfg. Co., 50 Vesey St.,

UNION Elevator & Machine C
tario St., Chicago, Ill.

WARNER Elevator Mfg. Co.
Grove Ave., Cincinnati, O.

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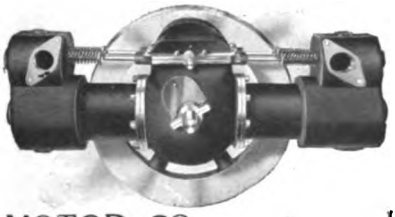
BEILFUSS AUTO MOTORS

SIZES:
18-20 H.P. 10-12 H.P.
Water Cooled.
Two-Cylinder Opposed.



10-12 H.P.
Air Cooled.
Two-Cylinder Opposed.
Send for Circulars.

THE BEILFUSS MOTOR CO., : LANSING, MICH.

The Perfection Buggy Washer

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RYAN & LONG
586 Oneida St., - Appleton, Wis.

"LIBERTY"

The DRY Chemical

Fire Extinguisher

Contains **THREE TIMES** more **Fire Destroying Power** than any so-called "Dry Powder" Extinguishers. **"LIBERTY"** is endorsed by the Fire Underwriters of Chicago, Detroit, Texas, Ohio and many other states and thousands are carried by automobile owners, clubs, garages, etc. Never failed in ten years—Lasts a lifetime—Always ready. Liberal discount to dealers.

Write at once for Exclusive Agency in your Town—1,000,000 in use—weighs 3 lbs.

Manufactured only by

"LIBERTY" ASSOCIATION
12 State St., CHICAGO, U. S. A.

ELECTROLYTE

ABSOLUTELY FREE FROM IMPURITIES, FOR STORAGE BATTERIES OF ALL KINDS

FRANKLIN H. KALBFLEISCH CO.

MANUFACTURING CHEMISTS

Broadway and Sixteenth Street
NEW YORK

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FIRE EXTINGUISHERS (Contin

LITTLE Giant Mfg. Co., 88 Wall St., N
City.

MARTEN-Diggs Fire Extinguisher Co.,
Centre St., N. Y. City.

MONARCH Fire Appliance Co., 249 P
St., New York City.

NEVERMISS Fire Extinguisher Co., Midc
town, N. Y.

PHOENIX Fire Appliance Co., 34 W. 26th S
N. Y. City.

REX Fire Extinguisher Co., 74 Cortlandt S
N. Y. City.

ROCKFORD-Kalamazoo Fire Extinguish
Co., 424 Ashton Bldg., Rockford, Ill.

STEMPEL Fire Apparatus Mfg. Co., 45
N. 20th St., St. Louis, Mo.

FANS

RADIATOR FANS

(See also Radiators)

A-Z Co., 527 W. 56th St., New York, N. Y.
(See page 177.)

CARY Co., Edward E., 59-61 Park Place,
New York, N. Y. (Importers). "Sankey."

KINSEY Mfg. Co., Dayton, O.

SANKEY—See Cary Co.

FASTENERS

CURTAIN FASTENERS

CARR, F. S., 74 Pearl St., Boston, Mass.
(See page 285.)

CRANDALL, Stone & Co., Binghamton,
N. Y.

CURRY & Abeles, 229 Mulberry St.,
Newark, N. J.
(See page 109.)

METAL Stamping Co., 243 West St., N. Y.
City.

MURPHY Co., G. W. J., Merrimac, Mass.

NEIDER Co., F. A., Augusta, Ky. "Peer-
less."
(See page opposite.)

PARRY & Co., A. N., Amesbury, Mass.

PEERLESS—See Neider Co.

ROEHM & Davison, Woodbridge & Wayne
Sts., Detroit, Mich.

SMITH & Co., Jos. N., 154-62 Fourth St.,
Detroit, Mich.
(See page 223.)

TAYLOR Co., H. D., 103-5 Oak St., Buffalo,
N. Y.

TURNER Brass Works, Sycamore, Ill.
(See page 205.)

UNITED States Fastener Co., 95 Milk
St., Boston, Mass.
(See page opposite.)

WEISS & Son, Chas., 4800 Cottage Grove
Ave., Chicago, Ill.

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BA
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BUC
St.
CEN
CRA
DAL
Bos
DARL
Pa.
DETR
G. T
DETR
Mich.
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Has Stood the Test for Over 10 Years

PATENTED

The Peerless Curtain Fastener Has No Springs.

Warranted to Outlast the Car.

Made to clinch, drive, screw or rivet, in Solid Brass. Polished and Lacquered or Japanned to match materials. Price lower than any other Fastener.

Beware of inferior imitations.

Ask your supply house or write us for free samples and prices.

The F. A. NEIDER CO.
AUGUSTA, KY.

Ask for No. 7 Catalogue of clinch buttons, knobs and fasteners.

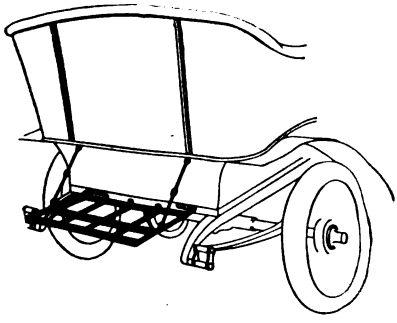
KIMBALL Automobile Bodies of all styles

Built to order from Special Individual Designs in Finest Quality and Finish.

Limousines, Landaulets, Touring, Phaeton and Runabout Bodies, Fitted to American and Foreign Chassis.

Kimball Patent Folding Glass Wind Shields and Patent Extra Folding Seats for sale Retail and Wholesale

C. P. KIMBALL & CO.
315 Michigan Avenue
CHICAGO, ILL.



"Standard" Auto Trunk Racks

Made Single and Double Folding of the best Steel and finished in Black Enamel Baked on. Also Manufacturers of High Grade Auto Trunks.

PRICES RIGHT.

Estimates of Special Racks furnished Manufacturers upon receipt of Blue Print.

CONNECTICUT STEEL & WIRE CO.
57-61 Allyn Street, HARTFORD, CONN.

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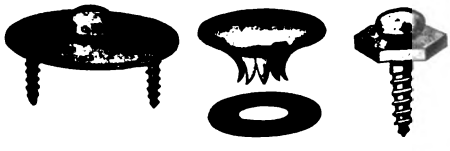
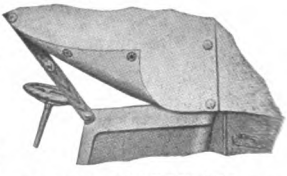
All styles and sizes for AUTOMOBILES. Now used in the leading Motor Cars. Prompt Deliveries. Write for prices.





United States Fastener Company 95 MILK STREET, BOSTON, MASS.

Manufacturers of Snap Fasteners and Metal Goods.

REPRESENTED AT NEW YORK CITY 450 Broome St. GLOVERSVILLE, N. Y. 21 West Fulton St. CHICAGO, ILL. 237 Fifth Ave.

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BRASS PIPE FITTINGS (Continued)

EATON, Cole & Burnham Co., Bridgeport, Conn.

FEWLESS-Leen Brass & Iron Co., Cincinnati, O.

HAMLIN & Emery Brass Co., 26 Island St., Boston, Mass.

HAYDENVILLE Co., Haydenville, Mass.

HOFFMAN & Billings Manufacturing Co., 100 Second St., Milwaukee, Wis.

HUMPHREYS Mfg. Co., Mansfield, O.

IDEAL Manufacturing Co., Detroit, Mich.

ILLINOIS Malleable Iron Co., 535 Diversey Bldg., Chicago, Ill.

IMPERIAL Brass Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill. (See page 57.)

JARECKI Manufacturing Co., Erie, Pa.

KELLY & Jones Co., Greensburg, Pa.

KINSEY & Mahler Co., Peoria, Ill.

LUNKENHEIMER Co., Cincinnati, O.

McDONALD & Morrison Manufacturing Co., A. Y., Dubuque, Iowa.

McNAB & Harlin Mfg. Co., 56 John St., N. Y. City.

McRAE & Roberts Co., 227-35 Campbell Ave., Detroit, Mich.

MANSFIELD Manufacturing Co., Pittsburg, Pa.

MILWAUKEE Brass Mfg. Co., Milwaukee, Wis.

MULLANEY'S Sons, Jas., 141 E. 25th St., N. Y. City.

NEW Britain Brass Co., New Britain, Conn.

PITTSBURG Valve & Fittings Co., 1610 Frick Bldg., Pittsburg, Pa.

POWELL Co., Wm., 2525 Spring Grove Ave., Cincinnati, O.

POWHATTAN Brass & Iron Works, Charlestown, W. Va.

QUEEN City Brass & Iron Works, Spring Grove Ave., Cincinnati, O.

REGESTER'S Sons Co., J., Holliday & Saratoga Sts., Baltimore, Md.

RUNDLE-Spence Mfg. Co., Milwaukee, Wis.

SHERMAN Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich.

SPEAKMAN Supply & Pipe Co., Wilmington, Del.

STANDARD Sanitary Mfg. Co., Pittsburg, Pa.

STEBBINS Mfg. Co., E., Springfield, Mass.

THOMAS Brass and Iron Co., Waukegan, Ill.

TURNER Brass Works, Sycamore, Ill. (See page 205.)

WALWORTH Manufacturing Co., Boston, Mass.

WESTERN Tube Co., Kewanee, Ill.

WILLIAMS Valve Co., D. T., 521-23 Hunt St., Cincinnati, O.

TOP FI

(See also Bow
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AMESBURY bury, Ma (See page

BLAKESLE

COLUMBUS St., Colun

COOPS Co., Mass.

CORTLAND N. Y.

CORTLAND (See page

CRANDALL

CURRY & Newark, (See page

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IMPERIAL Jefferson (See page

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MURPHY

NON-CORR Mass.

PARRY &

RANDS Mf Mich.

SCHERER Detroit, M

SMITH & Detroit, (See page

PRESSE

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AVERY S Ave., Cle (See pag

BOSTON St., Worc

CROSBY (See pag

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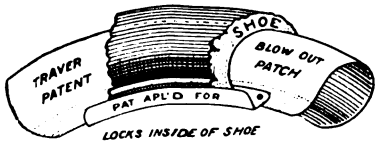

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KEIM Mills, John R., Liberty St. & Kensington Ave., Buffalo, N. Y.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio.
(See page 49.)

PARISH & Bingham Co., 5363 Hamilton Ave., Cleveland, O.
(See page 93.)

STANDARD Welding Co., Cleveland, O.

WORCESTER Pressed Steel Co., Greendale, Mass.

FLOATS

CORK CARBURETER FLOATS

ARMSTRONG Cork Co., 23d St. & Railroad Ave., Pittsburg, Pa.

METAL CARBURETER FLOATS

CROSBY Co., Buffalo, N. Y.
(See page 83.)

GOODWIN & Kintz Co., Winsted, Conn.

HERCULES Float Works, 200 Franklin St., Springfield, Mass.

KONIGSLOW Mfg. Co., Otto, Cleveland, Ohio.
(See page 49.)

NAUGATUCK Mfg. Co., Naugatuck, Conn.

TURNER Brass Works, Sycamore, Ill.
(See page 205.)

WORCESTER Pressed Steel Co., Greendale. Mass.

FLUX

BRAZING FLUX

(See Compounds, Brazing)

SOLDERING FLUX

ALLEN Co., L. B., 1321 Columbia Ave., Chicago, Ill.

ATLANTIC Chemical Works, 9 Seabring St., Brooklyn, N. Y.

BENSON, A. R., Hudson, N. Y.

BURNLEY Battery & Mfg. Co., Painesville, Ohio.

CALLAHAN & Co., Geo., 218 Front St., New York, N. Y.

CHASE & Bissell, Versailles, Pa.

COCHRANE Chemical Co., Boston, Mass.

CRESCENT Co., Valparaiso, Ind.

DUNTON & Co., M. W., 65 Atlantic Ave., Providence, R. I. "Nokorode."

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WALS

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DRIGGS-Seabury Ordnance Corp., Sharon, Pa.

ECCLES, Richard, Auburn, N. Y.

GENERAL Drop Forge Co., 1738 Elmwood Ave., Buffalo, N. Y.

GRANGER'S Drop Forge Works, Chicago, Ill.

INDIANAPOLIS Drop Forging Co., Madison Ave. & Downey St., Indianapolis, Ind.

KEYSTONE Drop Forge Works, Chester, Pa.

KILBORN & Bishop Co., 81 Lloyd St., New Haven, Conn.

MACHINERY Forging Co., Hamilton & Marquette Sts., Cleveland, O.

MICHIGAN Bolt & Nut Works, foot of Meldrum Ave., Detroit, Mich.

MOORE Drop Forging Co., Springfield, Mass.

PAIGE-Storms Drop Forge Co., Chicopee Falls, Mass.

REVERE Drop Forge Co., Revere, Mass.

RICHMOND Forging Corporation, Belle Isle, Richmond, Va.

SCRANTON Forging Co., Scranton, Pa.

SEWARD & Son Co., M., Grant St., New Haven, Conn.

SMITH & Co., H. D., Plantsville, Conn.

STRIEBY & Foote Co., 301 Ogden St., Newark, N. J.

TRASNUE & Williams Co., Alliance, Ohio.

UNION Drop Forge Co., 64-76 E. Ohio St., Chicago, Ill.

WESTERN Drop Forge Co., Marion, Ind. (See page 15.)

WESTERN Malleable Steel Co., 1250 River St., Detroit, Mich.

WHITMAN & Barnes Mfg. Co., Chicago, Ill.

WILCOX Mfg. Co., D., Mechanicsburg, Pa.

WILLIAMS & Co., J. H., 150 Hamilton Ave., Brooklyn, N. Y.

WYMAN & Gordon Co., Worcester, Mass., & Cleveland, O.

FRAMES

PRESSED STEEL FRAMES

AMERICAN & British Mfg. Co., Bridgeport, Conn.

BETHLEHEM Steel Co., So. Bethlehem, Pa.

DRIGGS-Seabury Ordnance Corp., Sharon, Pa.

HYDRAULIC Pressed Steel Co., Cleveland, O. (See cover.)

KINSEY Mfg. Co., 1126 E. Third St., Dayton, Ohio.

PARISH Mfg. Co., 7th & Chestnut Sts., Reading, Pa.

PARISH & Bingham Co., 5363 Hamilton Ave., Cleveland, O. (See page opposite.)

SMITH Co., A. O., 241 Clinton St., Milwaukee, Wis. (See page 199.)

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DOVER Ave., C

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VOGEL & lyn, N.

WILSON cago, Il

G.

BOSTON cial St.,

BRIDGEP suth St.,

BRISCOE Newark, (See pa

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GOODWIN & Kintz Co., Winsted, Conn.

GUILLOTT Metal Gasket Co., 97 S. Clinton St., Chicago, Ill.

HERZ & Co., 203-5 Lafayette St., New York. N. Y. (Importers).

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill. "McKim." (See page 127.)

McKIM—See McCord & Co.

SMOOTH-ON Mfg. Co., 572-74 Communipaw Ave., Jersey City, N. J.

UNITED States Indestructible Gasket Co., 16 So. William St., N. Y. City.

UNITED States Mineral Wool Co., 143 Liberty St., N. Y. City.

GATES

AUTOMATIC DRIVEWAY GATES

BYERLY—See International Fence & Fireproofing Co.

INTERNATIONAL Fence & Fireproofing Co., Columbus, O. "Byerly."

MANLOVE Gate Co., 272 Huron St., Chicago, Ill.

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AMERICAN Coil Co., Cocasset & Wall Sts., Foxboro, Mass.

AMERICAN Electrical Novelty & Mfg. Co., 308 Hudson St., New York, N. Y. "Ever Ready."

CONNECTICUT Telephone & Electric Co., Meriden, Conn.

DITTMAR—See Manhattan Electrical Supply Co.

DOW Portable Electric Co., Adams St., Braintree, Mass.

ELDREDGE Electric Mfg. Co., 7 Post Office Square, Springfield, Mass. "Advance."

ELITE—See Manhattan Electrical Supply Co.

EVER Ready—See American Electrical Novelty & Mfg. Co.

KENT Mfg. Works, Atwater, 50 N. Sixth St., Philadelphia, Pa. (See page opposite.)

KEYSTONE Electrical Instrument Co., 9th St. & Montgomery Ave., Philadelphia, Pa.

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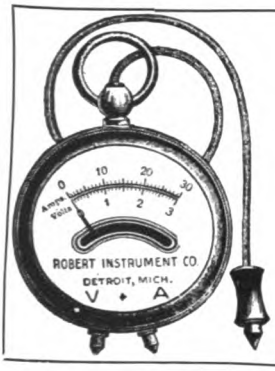

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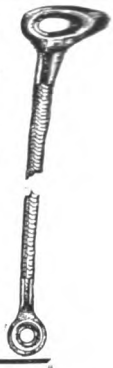

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GASOLINE TANK GAUGES
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TURNER Brass Works, Sycamore, Ill. "Ross."
(See page 205.)

WEBSTER Mfg. Co., 72 Brush St., Detroit, Mich.

STEAM AND AIR GAUGES
(Standard Pressure Gauges)

AMERICAN Steam Gauge & Valve Mfg. Co., Jamaica Plains, Boston, Mass.

ASHCROFT Mfg. Co., 87 Liberty St., N. Y. City.

ASHTON Valve Co., 271 Franklin St., Boston, Mass.

BELFIELD & Co., H., 435 N. Broad St., Philadelphia, Pa.

CLEVELAND Steam Gauge Co., 1619 Merwin Ave., N. W., Cleveland, O.

CROSBY Steam Gage & Valve Co., 97 Oliver St., Boston, Mass.

MARSH & Co., Jas. P., 224 Washington St., Chicago, Ill.

PITTSBURG Gauge & Supply Co., 309 Water St., Pittsburg, Pa.

SCHAEFER & Budenburg Mfg. Co., Foxboro, Mass.

STANDARD Gauge Mfg. Co., 107 N. Franklin St., Syracuse, N. Y.

STAR Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

TIRE PRESSURE GAUGES
(For indicating pressure in tires—see also Valves, Tire Safety)

JUDD & Leland Mfg. Co., Clifton Springs, N. Y. "Washburn."

NATIONAL—See Wray Pump & Register Co.

STANDARD Auto Supply & Mfg. Co., 20 Broad St., New York, N. Y.

WASHBURN—See Judd & Leland Mfg. Co.

WRAY Pump & Register Co., 191-93 Mill St., Rochester, N. Y. "National."

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STANDARD Gauge Mfg. Co., 107 N. Franklin St., Syracuse, N. Y.

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MOTORISTS' GAUNTLETS
(See Gloves, Motorists')

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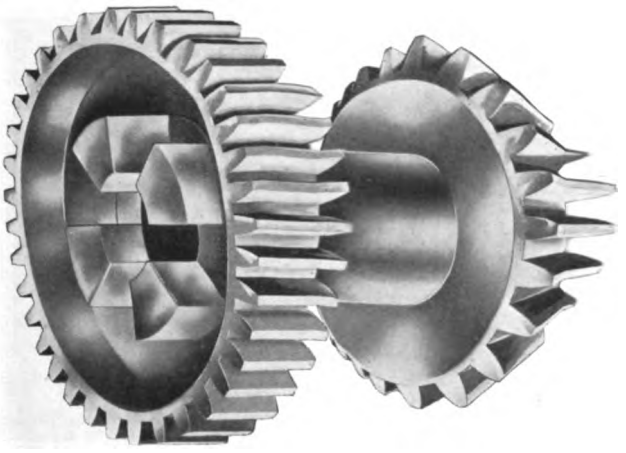

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JOES—See Snow & Petrelli Mfg. Co.

JOHNSON Machine Co., Carlyle, 356 Asylum St., Hartford, Conn.

MOTOR Parts Mfg. Co., 20 Sixth St., Detroit, Mich. "Triumph."
(See page 29.)

NEW York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.

SNOW & Petrelli Mfg. Co., 441 Chapel St., New Haven, Conn. "Joes."

STOWE Mfg. Co., Wilmington, Del.

TRIUMPH—See Motor Parts Co.

RUNNING GEARS

BORBEIN Auto Co., 2109 North 9th St., St. Louis, Mo.
(See page 49.)

GARFORD Co., Elyria, O.

JONES Motor Co., Geo. H., 6th & Erie Sts., Camden, N. J.

NEUSTADT Auto & Supply Co., St. Louis, Mo.
(See page 207.)

SMITH Co., A. O., 241 Clinton St., Milwaukee, Wis.
(See page 199.)

STEERING GEARS

AMERICAN Gear & Mfg. Co., 205 W. South St., Indianapolis, Ind.

BAKER Gear Co., Homer, N. Y.

BARNES Gear Co., Oswego, N. Y.

BLOOD Bros. Machine Co., Ransom St. & S. Haven R. R., Kalamazoo, Mich.

BORBEIN Auto Co., 2107 N. Ninth St., Louis, Mo.
(See page 49.)

BOSTON Gear Works, Norfolk Downs, Mass.

BROWN-Lipe Gear Co., Syracuse, N. Y.

BROWN & Sharpe Mfg. Co., Promenade St., Providence, R. I.

COLUMBUS Screw & Machine Co., 244-46 Kaiser St., Columbus, O.

ELYRIA Machine Parts Co., Elyria, Ohio.

GEMMER Mfg. Co., 741 Merrick Ave., Detroit, Mich.
(See page opposite.)

HARTFORD Auto Parts Co., Howard Bldg., Hartford, Conn.
(See page 115.)

HINDLEY—See Morse, Williams & Co.

LEE Mfg. Co., Port Huron, Mich.

MORSE, Williams & Co., 12th & Sansom Sts., Philadelphia, Pa. "Hindley."

MUNCIE Auto Parts Co., 700 Endicott St., Muncie, Ind.

MUNCIE Gear Works, 801 E. Charles St., Muncie, Ind.

PURITAN Machine Co., 97 Larned St., E., Detroit, Mich.

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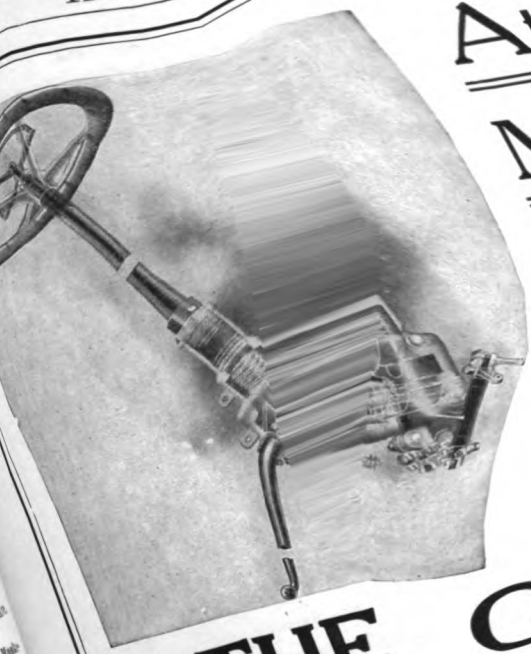

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(See page 199.)

SPACKE Machine Co., F. W., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.
(See page 183.)

STURTEVANT Mill Co., Harrison Sq., Boston, Mass.

SYRACUSE Gear Co., Syracuse, N. Y.

TOLEDO Auto Parts Mfg. Co., Missouri St. & L. S. & M. S. R. R., Toledo, O.
(See page opposite.)

TRANSO-DIFFERENTIAL—See Black Mfg. Co.

VIRTUE & Pound Mfg. Co., Owatonna, Minn.

WABASH Gear Works, 10th & Farrington Sts., Terre Haute, Ind.

WARNER Gear Co., Muncie, Ind.
(See page 69.)

WESTERFIELD Motor Co., Main St. & Big Four R. R., Anderson, Ind.
(See page 155.)

WIDMER Machine Works, 45 E. Fort St., Detroit, Mich.

METAL GEARS AND PINIONS

ADAPT Machinery Co., 1624-30 Wabash Ave., Chicago, Ill.

ARTHUR Co., 188 Front St., New York, N. Y.

BOSTON Gear Works, Norfolk Downs, Mass.

BULTMAN Co., F. H., 2108 Superior St. Viaduct, Cleveland, O.

EAGLE Gear & Machine Co., 141 Oxford St., Philadelphia, Pa.

EBERHARDT Bros. Machine Co., 66-68 Union St., Newark, N. J.

ELLSWORTH, J. M., 518 W. 22d St., New York, N. Y.
(See page 155.)

FAWCUS Machine Co., Pittsburg, Pa.

FELLOWS Gear Shaper Co., 23 Pearl St., Springfield, Vt.

FOOTE Bros. Gear & Machine Co., 24 S. Clinton St., Chicago, Ill.

GANSCHOW Co., Wm., 12 S. Clinton St., Chicago, Ill.

GOULD & Eberhardt, N. J. R. R. Ave. & Green Sts., Newark, N. J.

GRANT Gear Works, 6 Portland St., Boston, Mass.

GRANT-Lees Machine Works, Quincy Ave. & 69th St., Cleveland, O.

HINDLEY—See Morse, Williams & Co.

HORSBURGH & Scott Co., 5114 Hamilton Ave., Cleveland, O.

MORSE, Williams & Co., 12th & Sansom Sts., Philadelphia, Pa. "Hindley."

MUNCIE Auto Parts Co., 700 Endicott St., Muncie, Ind.

MUNCIE Gear Works, 801 E. Charles St., Muncie, Ind.

NEW Process Raw Hide Co., Syracuse, N. Y.
(See page opposite.)

NUTTALL Co., R. D., Fayette St. & Garrison Way, Pittsburg, Pa.

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BRONZE GEARS, IRON GEARS, HIDE GEARS and FIBER GEARS.
NOISELESS RAWHIDE GEARS, HERRINGBONE GEARS,
SPIRAL GEARS AND RACKS.
ANGLE GEARS AND RACKS.

New Process Raw Hide Co. Syracuse

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ACETYLENE GAS GENERATORS
(Continued)

ECO Mfg. Co., Walkhill St., Boston, Mass.

EDMUNDS & Jones Mfg. Co., 315 Riopelle St., Detroit, Mich.

GRAY & Davis, Amesbury, Mass.

GRAY & Sons, Peter, 88-90 Union St., Boston, Mass.

HANDY—See Dietz Co.

HAUCK-Seebach Co., 291-95 Essex St., Brooklyn, N. Y.

HINE-Watt Mfg. Co., 60 Wabash Ave., Chicago, Ill. "Columbia." (See page 119.)

KIMBALL Co., E. T., Motor Mart, Boston, Mass. "Westbrook."

MANHATTAN Brass Co., 328 E. 28th St., New York City.

MANHATTAN Screw & Stamping Works, 67th St. & West End Ave., New York, N. Y. "Phoebus."

MILLER Mfg. Co., Peekskill, N. Y.

MOORE & Son, M. E., Westfield, Mass.

NEVEROUT—See Rose Mfg. Co.

NEW York Coach & Auto Lamp Co., 794-98 10th Ave., New York, N. Y. "Universal."

PETERSON Mfg. Co., O. W., 1256 Michigan Ave., Chicago, Ill. (See page opposite.)

PHOEBUS—See Manhattan Screw & Stamping Works.

PYLE Mfg. Co., 2211 Park Ave., Indianapolis, Ind.

ROSE Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

RUSHMORE Dynamo Works, Plainfield, N. J.

SAXON Lamp Co., 526-32 W. 28th St., New York, N. Y.

SCOVILLE & Peck Co., 15 Wooster St., New Haven, Conn.

SOLAR—See Badger Brass Mfg. Co.

STANDARD Lamp & Mfg. Co., 43 So. Canal St., Chicago, Ill.

TWENTIETH Century Mfg. Co., 17 Warren St., N. Y. City.

UNIVERSAL—See New York Coach & Auto Lamp Co.

WESTBROOK—See Kimball Co.

GLOVES

MOTORISTS' GLOVES AND GAUNTLETS

ALLEN & Son, John C., Gloversville, N. Y.

AMERICAN Glove Co., 18 Churchill St., Chicago, Ill.

BELOIT Glove & Mitten Co., 217 Grand Ave., Beloit, Wis.

BOULEVARD—See Detroit Leather Specialty Co.

CHICAGO Auto Robe Supply Co., 155-59 Market St., Chicago, Ill.

CLARK Glove Co., Peabody, Mass.

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MEYRO City.

MUNSE N. Y.

NORTH St., Bo

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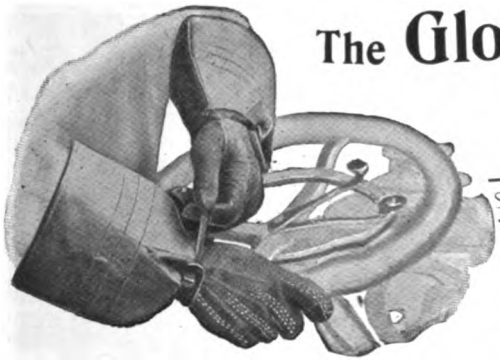


The Glove for the Motorist

Grinnell "Rist-Fit" Gloves (PATENTS ALLOWED)

Smooth as velvet but durable as steel

This glove fits closely to the hand and wrist, yet allows full freedom of movement.

The perforated back keeps the hands cool, prevents perspiration, gives elasticity to the gloves. Retail at $2.50 per pair up.

Made also without ventilated back, silk or wool lined, at $3.50 per pair up. Notice how the strap pulls over the wrist preventing dirt from getting in and sagging of the cuff. Made from reindeer leather, soft, pliable, washable. Write for prices and samples today while you think of it.

MORRISON, McINTOSH & CO., Makers
72 Broad Street, Grinnell, Iowa

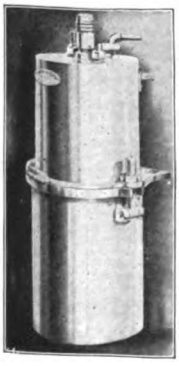
KANTRYP

AUTO GLOVE

The glove with no exposed seams—a patented feature which prevents ripping between fingers and around thumb. Its merits and our advertising will sell it for you.

WE MAKE A SPECIALTY OF FUR AUTO COATS

ELLSWORTH & THAYER MFG. CO., Milwaukee, Wis.



A Generator Without Trouble

$6.75 saved on every 100 cubic feet of gas consumed, with the Peterson New Automatic.

A positive automatic mechanical control of water feed by a needle, valve and diaphragm.

An automatic tossing carbide basket that rotates carbide.

The same pressure on top of water as in carbide chamber.

Without a bothersome vent hole.

An unfailing independent gas filter.

Write for catalog. Do it now.

O. W. PETERSON MFG. CO.
1256 Michigan Ave., - - CHICAGO

That's it

The valve fitting detached. This fitting contains all the mechanism and working parts of the generator, detachment being made by simply removing 2 nuts on top.

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MOTORISTS' GOGGLES AND EYE SHIELDS (Continued)

OPTHALMUSCOPE Co., Toledo, O.

SCHEIDIG & Co., John, 50 Maiden Lane, N. Y. City.

SPENCER Optical Mfg. Co., 15 Maiden Lane, N. Y. City.

SUSSFIELD, Lorsch & Co., 39 Maiden Lane, N. Y. City.

TEXAS Co., 95 E. Kinzie St., Chicago, Ill.

GONGS

MECHANICAL GONGS

(See Bells, Mechanical)

GRAPHITE

LUBRICATING GRAPHITE

(For Graphite Gears—See Lubricants)

DIXON Crucible Co., Jos., Jersey City, N. J.
(See page opposite.)

UNITED States Graphite Co., Saginaw, Mich.
(See page opposite.)

WISCONSIN Graphite Co., Allegheny, Pa.

GREASES

LUBRICATING GREASES

(See Lubricants)

GUARDS

MUD GUARDS AND FENDERS

A-Z Co., 527 W. 56th St., New York, N. Y.
(See page 177.)

AMERICAN Veneer Co., 666 Market St., Kenilworth, N. J.
(See page 41.)

AMESBURY Metal Body Co., Clark & Elm Sts., Amesbury, Mass.

AUTO Body Co., Franklin Ave., Lansing, Mich.
(See page 47.)

AVERY Stamping Co., 5209 Lakeside Ave., Cleveland, O.
(See page 47.)

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BRIDGEPORT Vehicle Co., South Ave. & Water St., Bridgeport, Conn.

BRISCOE Mfg. Co., Detroit, Mich., & Newark, N. J.
(See page 111.)

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Dixon's

Ticonderoga Flake

Graphite

For Motors

A number of special graphite lubricants for motor cars are prepared by the Dixon Company. The uses and merits of each or all will be explained to those writing to us. We list two:

Dixon's Motor Graphite

An especially fine grade of flake graphite for cylinders, gears, clutches, etc., to be used with oil.

Dixon's No. 688

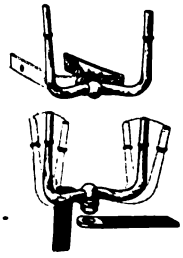
A graphited wood grease used with marked success for enclosed transmission gears.

Joseph Dixon Crucible Co.,

Jersey City, N. J.

Rochester Adjustable Lamp Bracket

A Bracket which is adjustable for the Automobile user in changing the lamp rays to strike the ground any distance he desires from the car: also adjustable for the Automobile dealer, in that it is readily attached and is adjustable for either right or left hand side, or the top or bottom of the Automobile frame.



Furnished with a strong Norway iron strap which can be bent cold in any vise to give the right offset for the machine for which it is wanted. Or we will furnish it offset for you if you so desire.

We furnish this Bracket with fork and nut brass plated, or we can furnish it all in black. We solicit a trial or sample order from every automobile dealer in the country, and assure you that small orders will be promptly and properly taken care of.

Brackets furnished in regular sizes, which are 7 inches and 8½ inches from end to end of fork. Any other widths made to order.

PRICES: Brass per pair, $6.50 Black, per pair, $5.00

WRITE FOR TRADE DISCOUNT

Thomas J. Northway

102 Exchange St, Rochester, N. Y.

SQUEAK DEVILS LEFT BEHIND

At every point friction in automobiles is reduced to a minimum (almost nothing) and squeaks and groans are stopped by gritless, dripless

Mexican Graphite (U. S. G. Co.'s) Auto-Lubricant

Made by our own special processes from U.S.G. Co.'s pure, soft Graphite powder, ***not flake,*** but air-floated, gritless and dripless. We mine our Graphite from our own Mexican mines.

For automobile owners, dealers, garages and auto-boat owners we make three unequalled lubricating specialties, essential to power, speed and efficiency, insuring reduced wear, less repairs, *long machine life*, safety to passengers and supreme confidence in your car's performance. For twenty *cents to pay postage* we send once only to any address one thirty-five cent pound can Auto-Lubricant *free*. *Please name your* dealer. Ask for Booklet M 1.

The United States Graphite Co., Saginaw, Mich., *U.S.A.*

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OIL GUNS

AMERICAN Motor Parts Co., 21-25 Plymouth Court, Chicago, Ill.

B-LINE—See Randall-Faichney Co.

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

ELKHART Brass Mfg. Co., 908 Prospect St., Elkhart, Ind.

FRIES & Co., 91 Main St., Buffalo, N. Y.

GLEASON-Peters Air Pump Co., 181 Mercer St., New York, N. Y.

HASTINGS & Anderson, 116 Lake St., Chicago, Ill.

HAUCK-Seebach Co., 291-295 Essex St., Brooklyn, N. Y.

MANHATTAN Screw & Stamping Works, 67th St. & West End Ave., N. Y. City.

MILLER Mfg. Co., Peekskill, N. Y.

MOTOR Car Supply Co., 1425-27 Michigan Ave., Chicago, Ill. "Oiljammer." (See page opposite.)

NEW York Coach & Auto Lamp Co., 794-98 10th Ave., New York, N. Y. "Universal."

NEW YORK & New Jersey Lubricants Co., 14 Church St., N. Y. City.

NOERA Mfg. Co., Waterbury, Conn.

OILJAMMER—See Motor Car Supply Co.

RANDALL-Faichney Co., Boston, Mass. "B-Line." (See page 77.)

TURNER Brass Works, Sycamore, Ill. (See page 205.)

UNIVERSAL—See New York Coach & Auto Lamp Co.

M. & City

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CURE New (See

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HILL ton,

IMPE fers (See

MURF

SMITI Detr (See

WHIT

HAIR

CURLED HAIR

ARMOUR & Co., Chicago, Ill.

BAEDER, Adamson & Co., 67 Beekman St., N. Y. City.

BENTLEY Hair Co., Joseph, Methuen, Mass.

MITCHELL Co., P. R., Spring Grove & Harrison Aves., Cincinnati, O.

WILKINS & Co., Wm., Frederick Ave. & Wilkens St., Baltimore, Md.

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CHICA Chica

HAMPERS

AC

TOURING HAMPERS, BASKETS AND LUNCH BOXES

(See also Trunks, Automobile)

ATLAS Mfg. Co., High St., Hampton, N. H.

BAILIE Basket Co., 85-87 Hudson St., Boston, Mass.

BOSTON Mat & Basket Co., 62 Fulton St., Boston, Mass.

BURLINGTON Basket Co., Burlington, Ia.

HEYWOOD Bros. & land St., Boston,

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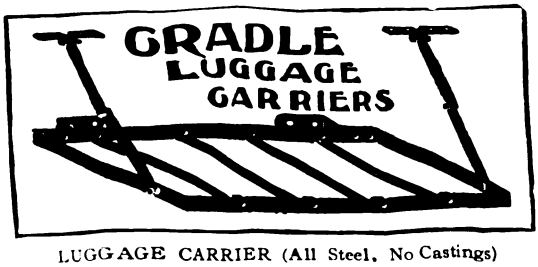
We make a specialty of

Spark Coil Parts and Platinum Points

AND DO EXPERT COIL REPAIRING IN ALL ITS BRANCHES

See illustrations of a few parts on margins



LUGGAGE CARRIER (All Steel, No Castings)

No tourist has his car quite Complete without a Luggage Carrier. Its convenience appeals to every owner who takes country runs. A couple of suit cases, a small trunk or bundles, can be strapped on in a moment. They are easily adjusted to any car with ordinary tools.

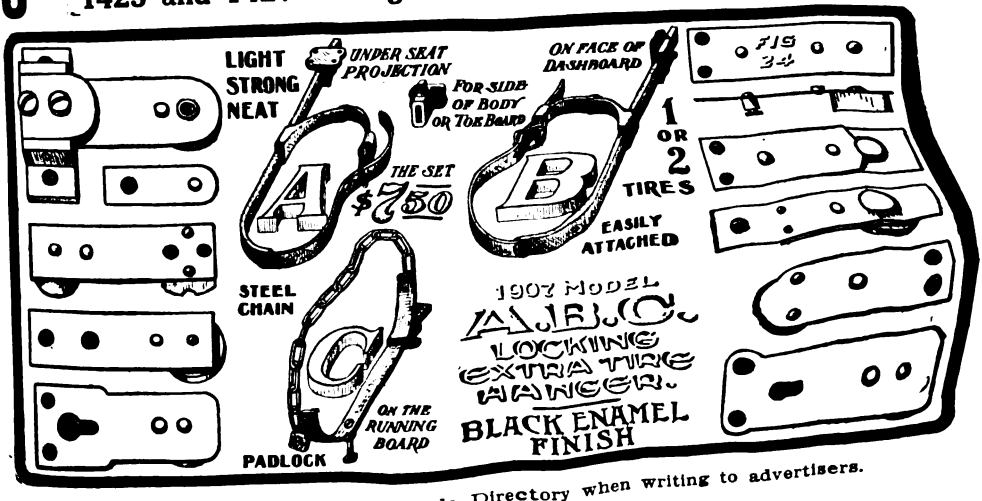
The price complete, black japanned, is ONLY $9.00, which is very reasonable for the article.

In ordering "Cradle" Luggage Carriers give the width of body if you wish it set above the spring hangers; if you wish it hung as shown in cut, give the distance between the spring hangers. Write for discount.

NEW CATALOGUE ON THE PRESS
WRITE FOR IT

THE MOTOR CAR SUPPLY CO.

1425 and 1427 Michigan Ave. CHICAGO, ILL.



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AUTOMOBILE HEATERS
(Continued)

LEHMAN Bros., 10 Bond St., N. Y. City.

MOTOR Car Heater Co., 84 Adams St., Chicago, Ill.

OLMSTED & Son, H. R., 413 S. Clinton St., Syracuse, N. Y.

STANDARD Stamping Co., Marysville, O.

FEED WATER HEATERS

NATIONAL Pipe Bending Co., New Haven, Conn.

OFELDT & Sons, F. W., Nyack-on-the-Hudson, N. Y.

RANLET Automobile Co., St. Johnsbury, Vt.

WHITLOCK Coil Pipe Co., Hartford, Conn.
(See page 179.)

HINGES

DOOR HINGES

DOUGLAS & Lomason Co., Detroit, Mich.

ENGLISH & Mersick Co., New Haven, Conn.

HILLMAN Plating & Auto Supply Co., Boston, Mass.

SMITH & Co., Jos. N., 154-62 Fourth St., Detroit, Mich.
(See page 223.)

HOOD HINGES

A-Z Co., 527 W. 56th St., New York, N. Y.
(See page 177.)

SMITH & Co., Jos. N., 154-62 Fourth St., Detroit, Mich.
(See page 223.)

WHITLOCK Coil Pipe Co., Hartford, Conn.
(See page 179.)

HOISTS

PORTABLE HOISTS

(See Cranes, Portable)

HOLDERS

STARTING CRANK HOLDERS

GILBERT Mfg. Co., New Haven, Conn.
(See page 267.)

NATHAN Novelty Mfg. Co., New York, N. Y.

A. B. C.-
AMCO—
ALLEN
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AMERIC
Court,
APPLIA
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ATLAS—
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SMITH &
Detroit,
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UNIVERS
Lamp Co

COWLES &
New Hav
ENGLISH
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KEYSTONE
RUMPP &
Philadelph

AMESBURY
Sts., Ames
A-Z Co., 52
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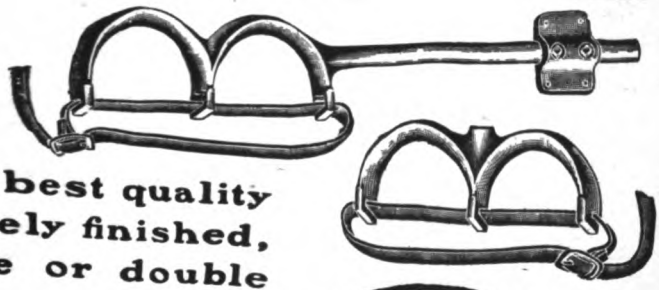
The Big Trade Winner
THE ADJUSTABLE TIRE HOLDER



Made of best quality brass, finely finished, for single or double tires.

LIST PRICE, $5.00 FOR SINGLE.
LIST PRICE, $7.00 FOR DOUBLE.

DEALERS

This tire holder needs only to be shown to find ready sale. Special discount to supply houses and manufacturers. We make all brass fixtures for tops and bodies. Robe rails, foot-rests, lamp brackets, curtain fasteners, curtain rollers, window frame fixtures, goose-necks, bow-rests, bow separators, footman loops, felloe plates, snap loops, prop nuts, horn holders, etc. Write us.

CURRY & ABELES
SUCCESSORS TO
Walter J. Harper Company
229 Mulberry Street,
Newark, N. J.

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MOTOR HOODS (Continued)

BADGER & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

BRIDGEPORT Vehicle Co., South Ave. & Water St., Bridgeport, Conn.

BRISCOE Mfg. Co., Detroit, Mich., & Newark, N. J. (See page opposite.)

DETROIT Auto Specialty Co., 910 Greenwood Ave., Detroit, Mich. (See page 179.)

FEDDERS Mfg. Works, Buffalo, N. Y.

HAYES Mfg. Co., 360-370 Maybury Ave., Detroit, Mich. (See page opposite.)

KELLS Mfg. Co., W. J., 60-62 Van Winkle Ave., Jersey City, N. J.

KINSEY Mfg. Co., 1126 E. Third St., Dayton, O. "Kinwood."

KINWOOD—See Kinsey Mfg. Co.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

LONG-Turney Mfg. Co., Rome, N. Y.

MAYO Radiator Co., New Haven, Conn. (See page 179.)

MULLINS Co., W. H., Salem, O.

NOYE Mfg. Co., 50 Lakeview Ave., Buffalo, N. Y.

OFF & Co., Christian, 5 N. New Jersey St., Indianapolis, Ind.

OHIO Blower Co., 330 Prospect Ave., N. W., Cleveland, O.

SPRINGFIELD Metal Body Co., 397 Birnie Ave., Brightwood, Mass. (See page 279.)

WHITLOCK Coil Pipe Co., Hartford, Conn. (See page 179.)

WRIGHT Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill.

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NEW Yorl
10th Ave

ROSS *Eng*
Chicago,

SYMPHON
Detroit,

TRINITY
Indianapo

UNIVERSA
Lamp Co.

HORNS

BULB HORNS

ACORN Brass Mfg. Co., 51 N. Peoria St., Chicago, Ill.

AUTOMOBILE Supply Mfg. Co., 139-47 Emerson Place, Brooklyn, N. Y. "Nonpareil."

ECHO—See Tripari Bros. & V. De Prisco Co.

INTERNATIONAL Auto Horn Mfg. Co., 151 E. 126th St., New York, N. Y.

MANHATTAN Screw & Stamping Works, 67th St. & West End Ave., New York, N. Y.

NONPAREIL—See Automobile Supply Mfg. Co.

RILEY-Klotz Mfg. Co., 17 Mulberry St., Newark, N. J.

TRIPARI Bros. & V. De Prisco Co., 179 Mott St., New York, N. Y. "Echo." (See page 187.)

LEAVITT—

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Mfg. Co.

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UNCAS Sp
"Leavitt."

ELECTRIC HORNS AND HORN BLOWERS

GARY Co., Theodore, H., New York, N. Y. "Grack-Unicum."

AKRON Rubb

ANCHOR—Se

BOSTON Belt
Boston, Mas

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BRISCOE RADIATORS

WE make many different types, as, Honeycomb, Flat Tube, Round Tube, Staggered Tube, Film Tube; with either horizontal or vertical flow; with or without casing; to use with or without pump. These types and arrangements differ from one another in efficiency, compactness, cost and appearance. If you will let us know the conditions and the problem we can generally work it out for you.

Remember we have been the leaders in this business since the automobile industry started in the United States.

We also make Fenders, Tanks, Hoods, etc.

Delivery insurance of two plants with duplicate equipment and duplicate patterns for each order.

We repair all kinds of radiators. Send them to our nearest factory. Write to-day for our new Catalog.

BRISCOE MFG CO.

DETROIT, MICH. NEWARK, N. J.

GARAGE FLOOR PAN

Size 30 in. x 94 in.
Galvanized Iron.
Reinforced on bottom with ½ in. angle iron.
Fitted with casters.
Enameled Black.

Best of everything in Radiators, Hoods, Fenders, Forged Irons, Dashes, Tanks, Tool and Battery Boxes

HAYES MFG. CO.

360-70 Maybury Ave. DETROIT

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RUBBER HOSE (Continued)

BOSTON Woven Hose & Rubber Co., 64 India St., Boston, Mass.

CLEVELAND—See Mechanical Rubber Co.

CLEVELAND Rubber Works, C. & P. R. R. junction of Nickel Plate R. R., Cleveland, O.

COMBINATION Rubber Mfg. Co., Bloomfield, N. J.

CONSOLIDATED Rubber Co., Trenton, N. J.

CONTINENTAL Rubber Works, Erie, Pa.

CRESCENT Belting & Packing Co., Trenton, N. J.

DIAMOND Rubber Co., Akron, O. (See page 225.)

GOODRICH Co., B. F., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

GOTHAM Rubber Co., 45 South St., New York, N. Y.

GUTTA Percha & Rubber Mfg. Co., 126 Duane St., New York, N. Y.

HAMILTON Rubber Mfg. Co., Trenton, N. J.

HOME Rubber Co., Trenton, N. J.

LAKE Shore Rubber Co., Erie, Pa.

MANHATTAN Rubber Mfg. Co., 18 Vesey St., New York, N. Y.

MECHANICAL Rubber Co., Cleveland, O. "Cleveland."

MERCER Rubber Co., Trenton, N. J.

MINERALIZED Rubber Co., 18 Cliff St., New York, N. Y. "Anchor."

NATIONAL India Rubber Co., Bristol, R. I.

NEW Jersey Car Spring & Rubber Co., Jersey City, N. J.

NEW York Belting & Packing Co., 91 Chambers St., New York, N. Y.

NEW York Rubber Co., 84 Reade St., Ne York, N. Y.

PEERLESS Rubber Mfg. Co., 16 Warren St New York, N. Y.

PENNSYLVANIA Rubber Co., Jeannette, P

QUAKER City Rubber Co., 629 Market S Philadelphia, Pa.

REPUBLIC Rubber Co., Youngstown, O.

REVERE Rubber Co., 77 Bedford St., B ton, Mass.

SEWARD Rubber Co., Berlin, Conn.

STOKES Rubber Co., Jos., Trenton, N. J

TRENTON Rubber Mfg. Co., Tren N. J. (See page 225.)

UNITED & Globe Rubber Mfg. Co., T ton, N. J.

VOORHEES Rubber Mfg. Co., Jersey N. J.

WATERBURY Rubber Mfg. Co., 75 W St., New York, N. Y.

WATTS Sons, John M., 123 S. Secon Philadelphia, Pa.

WHITEHEAD Bros. Rubber Co., T N. J.

HOUSES

PORTABLE HOUSES

ALADDIN—See North American C tion Co.

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MANUFACTURERS' AGENTS

Look Sparking Batteries

4, 6, 8 Volt, 40, 60 and 80 Amp.

Bell Pressure Indicating Pumps

IMPORTED FRENCH COILS, PLUGS, MAGNETOS AND COMMUTATORS.

FRANCO-AMERICAN AUTO AND SUPPLY COMPANY

1404-1406 Michigan Ave. CHICAGO

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TESTING HYDROMETERS
(Continued)

QUEEN & Co., Eighth & Arch Sts., Philadelphia, Pa.

SCHAEFFER & Budenberg Mfg. Co., Foxboro, Mass.

STORAGE Battery Supply Co., 239 E. 27th St., New York, N. Y.

TAYLOR Bros. Co., Rochester, N. Y.

VUILLE, Chas. A., Huntington, Pa.

WATERTOWN Thermometer Co., Watertown, N. Y.

WEINHAGEN, H., 22-24 N. William St., New York, N. Y.

INFLATORS

TIRE INFLATORS

(See Pumps; also Tanks)

INJECTORS

BOILER FEEDING INJECTORS

PENBERTHY Injector Co., 360 Holden Ave., Detroit, Mich.

GREASE INJECTORS

(See Guns, Grease)

INTENSIFIERS

SPARK INTENSIFIERS

(See Gaps, Spark)

IRONS

BODY OR TOP IRONS

ANDERSON Forge & Machine Co., 21-31 St. Aubin Ave., Detroit, Mich. (See page 75.)

BLAKESLEE Forging Co., Plantsville, Conn.

CLEVELAND Hardware Co., 45th St. & Lakeside Ave., Cleveland, O.

CORTLAND Carriage Goods Co., Cortland, N. Y.

CORTLAND Forging Co., Cortland, N. Y. (See page 89.)

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SMITH & Co., Jos. N., 154-62 Fourth St., Detroit, Mich. (See page 223.)

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DRUE
Conn
PARR

ATLAS
BARRE
BARTH
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BUCKE
COOK'S
"Stand
COVER
CRACK
Iron C
DUFF M
EUREK
JERSEY
N. J.
LEADE
LEATHE
MILLER
OLIVER
Chicag
OSBORN
PATTER
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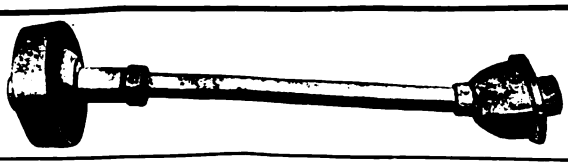

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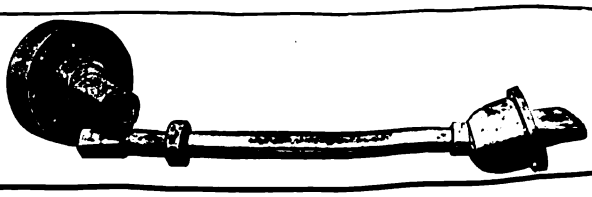

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SHAWVER Co., Springfield, O. "Sprin field."

SPRINGFIELD—See Shawver Co.

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RUBBER BATTERY JARS

AMERICAN Hard Rubber Co., New Y N. Y.

DIAMOND Rubber Co., Akron, O. (See page 225.)

MORGAN & Wright, Detroit, Mich. (See page 217.)

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VULCANIZED Rubber Co., New York, I

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BLOOD Bros. Machine Co., Ransom S. Haven R. R., Kalamazoo, Mich.

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COATES Clipper Mfg. Co., Wor Mass. (See page 133.)

GRAY & Prior Machine Co., Hartfor

HARTFORD Auto Parts Co., H Bldg., Hartford, Conn. (See page 115.)

HUSSEY—See Muncie Auto Parts C

K-B—See Kinsler-Bennett Co.

KINSLER-Bennett Co., 62 Mar Hartford, Conn. "K-B." (See page opposite.)

LEHMAN, I., 61 Middle St., Clevel

MOTOR Parts Mfg. Co., Sixth gress Sts., Detroit, Mich. (See page 29.)

MUNCIE Auto Parts Co., 700 En Muncie, Ind. "Hussey."

MUNCIE Gear Works, 801 E. Cl Muncie, Ind.

MUTUAL Machine Co., 25 Wells ford, Conn. "Warrens."

ROSS Gear & Tool Co., Main & Lafayette, Ind.

SPICER Universal Joint Mf Madison Ave., Plainfield, N. (See page 115.)

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WARRENS—See Mutual Machin

WIDMER Machine Works, 45 Detroit, Mich.

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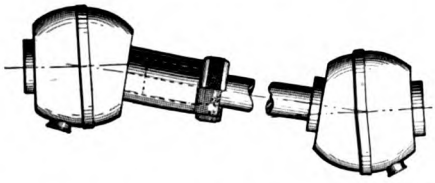

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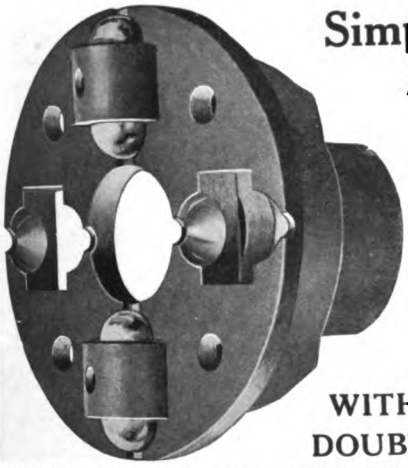

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COWLES & Co., C., Water & Chestnut Sts., New Haven, Conn.

DURO—See Chicago Battery Co.

SCOVILLE & Peck Co., 15 Wooster St., New Haven, Conn.

WHITE Mfg. Co., Bridgeport, Conn.

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AMERICAN Auto Brass Co., 181 W. Maple St., Columbus, O.

AMERICAN Lamp Co., 125 Monroe Ave., Detroit, Mich.

AMERICAN Lamp Works, 62 West 43d St., New York. "Liberty."

ATWOOD Mfg. Co., Amesbury, Mass.

AUTO Accessories Mfg. Co., Detroit, Mich. "Sterling." (See page 219.)

AUTOMOBILE Supply Mfg. Co., 139-47 Emerson Place, Brooklyn, N. Y.

BADGER Brass Mfg. Co., Kenosha, Wis. "Solar."

BROWN Mfg. Co., J. B., Columbus, O.

CHICAGO Auto Lamp Works, 71 W. Jackson Blvd., Chicago, Ill. "Diamond."

COLUMBIA—See Hine-Watt Mfg. Co.

DAYTON Mfg. Co., 2240 E. Third St., Dayton, Ohio.

DIAMOND—See Chicago Auto Lamp Works.

DIETZ Co., R. E., 33 Laight St., New York, N. Y.

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GRAY & Davis, Amesbury, Mass.

GRAY & Sons, Peter, 88-90 Union St., Boston, Mass.

HINE-Watt Mfg. Co., 60 Wabash Ave., Chicago, Ill. "Columbia." (See page opposite.)

LIBERTY—See American Lamp Works.

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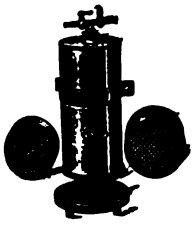

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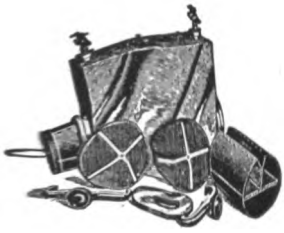

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TOURIST—See Ham Mfg. Co.

TWENTIETH Century Mfg. Co., 17 Warren St., New York, N. Y.

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VICTOR Lamp Co., 1249 Plum St., Cincinnati, O.

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AMERICAN Lava Co., Chattanooga, Tenn.

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CARR, F. S., 74 Pearl St., Boston, Mass. (Dealers)
(See page 285.)

CHASE Co., L. C., 89 Franklin St., Boston, Mass. (Dealers).
(See page 123.)

FABROKOID Co., Newburgh, N. Y.

LAIDLAW, Jr., Wm. R., 244-50 W. 49th St., New York, N. Y. (Dealer)
(See page 245.)

MOROCCOLINE—See Boston Artificial Leather Co.

MUTTY Co., L. J., 28 Summer St., Boston, Mass. (Dealers).
(See page 223.)

PANTASOTE Co., 11 B'way, New York, N. Y.
(See page 123.)

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RAHMAN & Co., Geo., 6 Ferry St., New York, N. Y.

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(See page 35.)

SCHIEREN & Co., Chas. A., 30 Ferry St., New York, N. Y.

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Philadelphia, Pa.

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ther Mfg. Co.

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ning Co., Ashtabula, O.

Son Corp., P., Newark, N. J.

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rk, N. J.

123.)

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ghany, Pa.

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ark, N. J.

Rothschild, Kosett &

k, N. J.

Sons, M., Newark, N. J.

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ELLSWORTH, J. M., 518 W. 22d St., New York, N. Y. **(See page 155.)**

LONG Arm System Co., Cleveland, O. **(See page 33.)**

MUNCIE Auto Parts Co., 700 Endicott St., Muncie, Ind.

MUNCIE Gear Works, 801 E. Charles St., Muncie, Ind.

SELECTIVE Lever Works, Terre Haute, Ind.

SMITH Co., A. O., 241 Clinton St., Milwaukee, Wis. **(See page 199.)**

WABASH Gear Works, 10th & Farrington Sts., Terre Haute, Ind.

WARNER Gear Co., Muncie, Ind. **(See page 69.)**

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ROLFE-Fox Company, 407 N. Livingston Bldg., Rochester, N. Y. "Auto-Light." **(See page 91.)**

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ABET Mfg. Co., Chicago, Ill. "Presto."

BESSELECTRIC Lighter Co., Scranton, Pa.

COWLES & Co., C., Chestnut & Water Sts., New Haven, Conn.

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, Pa.

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(See page 223.)

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(See also Fittings, Top)

CURRY & Abeles, 229 Mulberry St., Newark, N. J.
(See page 109.)

GLOBE Brass Works, 15-17 Macomb St., Detroit, Mich.

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

SMITH & Co., Jos. N., 154-62 Fourth St., Detroit, Mich.
(See page 223.)

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OILS AND GREASES

A. W. H.—See Harris Oil Co.

ACME Oil & Supply Co., 345 S. Canal St., Chicago, Ill.

ALEXANDER & Co., H. T., 17 State St., New York, N. Y. "Panhard."

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AUTOLINE—See Robinson & Sons Co.

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BORNE-Scrymser Co., Claremont, N. J. "Colonial."

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(See page opposite.)

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DEARBORN Drug & Chemical Works, Chicago, Ill.

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KANTE City.

KELLO New

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MACLE Long

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PENN Oil & Supply Co., Chicago, Ill.

PENN Petroleum Co., 117 North Second St., Philadelphia, Pa.

PHILADELPHIA Grease Mfg. Co., The Bourse, Philadelphia, Pa.

PIGOT, Sayre & Co., 135 William St., New York, N. Y. "Aurora."

PULVER & Sons, Peter, N. Y. City.

RED CROSS—See Auto Oil Co.

RELIANCE Oil & Grease Co., 1501-21 Columbus Road, Cleveland, O. "Electric," "National," "Oriental."

RICHARDSON Lubricating Co., Quincy, Ill.

ROBINSON & Son Co., Wm. C., 336-42 North St., Baltimore, Md. "Autoline."

ROYAL Lubricating Oil Co., 116 Broad St., New York, N. Y. "Min-Carb."

S. H.—See Harris Oil Co.

SHEPPARD, W. S., 22 Lawrence St., Newark, N. J.
(See page 173.)

SOLIDOYL—See Musliner & Co.

SPARROW—See American Oil & Disinfectant Co.

SPEAR'S Sons Co., Alden, 369 Atlantic Ave., Boston, Mass.

STANDARD Oil Co., 26 Broadway, N. Y. City.

STAR Lubricating Co., 140 W. 32nd St., N. Y. City.

SULLIVAN Oil Co., 48 Wells St., Chicago, Ill.

SWAN & Finch Co., 151 Maiden Lane, New York City.

SWEET, Charles F., 182 Pearl St., Hartford, Conn. "Climax," "Mercedes."

UNDERHAY Oil Co., 275 Franklin St., Boston, Mass.

UNITED States Graphite Co., Saginaw, Mich.
(See page 105.)

VACUUM Oil Co., Rochester, N. Y. "Mobiloil."

VALVOLINE Oil Co., 11 Broadway, New York, N. Y.

VISCOSITY Oil Co., 21 River St., Chicago, Ill.

WADHAMS Oil Co., Milwaukee, Wis. "Badgers."

WHALE—See Nye, Wm. F.

WHITE & Bagley Co., 100 Foster St., Worcester, Mass. "Oilzum."

WINN Co., F. R., 147 Maiden Lane, N. Y. City.

YOUNG, Orlando W., 180 Freylinghuysen Ave., Newark, N. J.
(See page 273.)

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ESSEX
Detr

IMPEI
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POWE
Cinci

MECH

CHART
Ill.

CRANI
Co.

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G. T.

HANCO
Charl
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HODGE

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McCAN
Chica

McCOR
Chica
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Ill. "

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New
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Ave.,
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SCHOEI
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(See

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Boston,

WESTE
Big F
(See

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NEELY, Edw., Chicago, Ill.

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ASHLEY Machine Wks., 714 University Ave., Rochester, N. Y.

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BULTMAN Co., F. H., 2108 Superior Ave., Viaduct, Cleveland, O.

CASSADY Fairbank Mfg. Co., 6106-30 La Salle St., Chicago, Ill.

CRANE & Whitman Co., 94-104 W. 7th St., Bayonne, N. J.

DIAMOND Chain & Mfg. Co., 231 West Georgia St., Indianapolis, Ind. (See page 65.)

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GILL 1 L

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HOL R. I

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JONE N.

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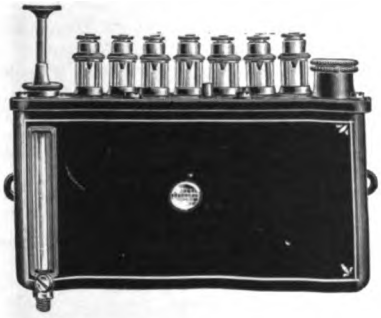
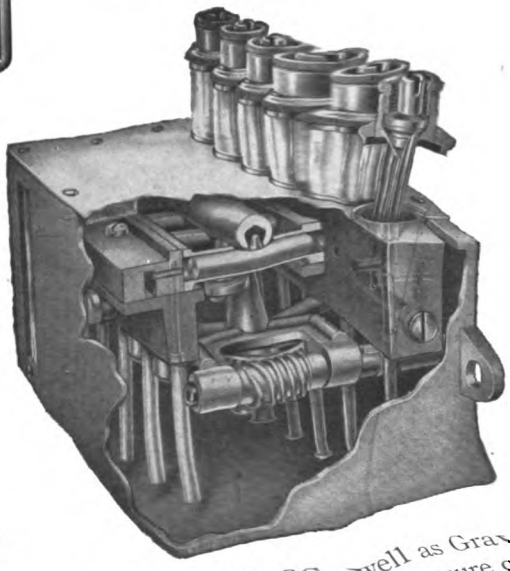


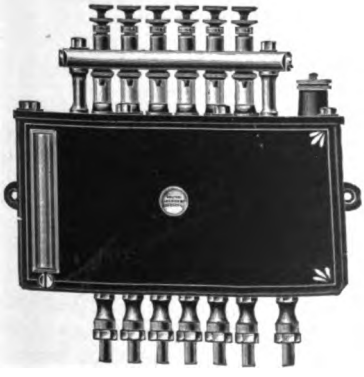
Have demonstrated their value on all grades of machines.

The highest class lubricator is as necessary to the life of a motor as a strong heart to a man.



This cut shows the mechanism of our Type L Oiler, in which there are no springs, check-valves or other uncertain devices; therefore it is free from the objectionable results incident with their use.

The working parts are reduced to the minimum number required to accomplish the results obtained.



Our Pressure as well as Gravity and Gravity and Pressure combined Oilers still lead in their respective fields. When order remember the best is always cheapest in the end, and write

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We manufacture Pedersen Fittings, Ferret Wrenches and Oil Burners

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DETROIT Twist Drill Co., Detroit, Mich.
GOODELL Mfg. Co., Greenfield, Mass.
GOODELL-Pratt Co., Greenfield, Mass.
GRONKVIST Drill Chuck Co., Jersey City, N. J.
HORTON & Son Co., E., Windsor Locks, Conn.
JACOBS Mfg. Co., Hartford, Conn.
MILLERS Falls Co., Millers Falls, Mass.
MORSE Twist Drill & Machine Co., New Bedford, Mass.
NATIONAL Tool Co., Cleveland, O.
ONEIDA National Chuck Co., Oneida, N. Y.
PRATT Chuck Co., Frankfort, N. Y.
PRATT & Whitney Co., Hartford, Conn. **(See page opposite.)**
SKINNER Chuck Co., New Britain, Conn.
UNION Mfg. Co., New Britain, Conn.
WESTCOTT Chuck Co., Oneida, N. Y.
WHITNEY Mfg. Co., Hartford, Conn.
WHITON Machine Co., D. E., New London, Conn.

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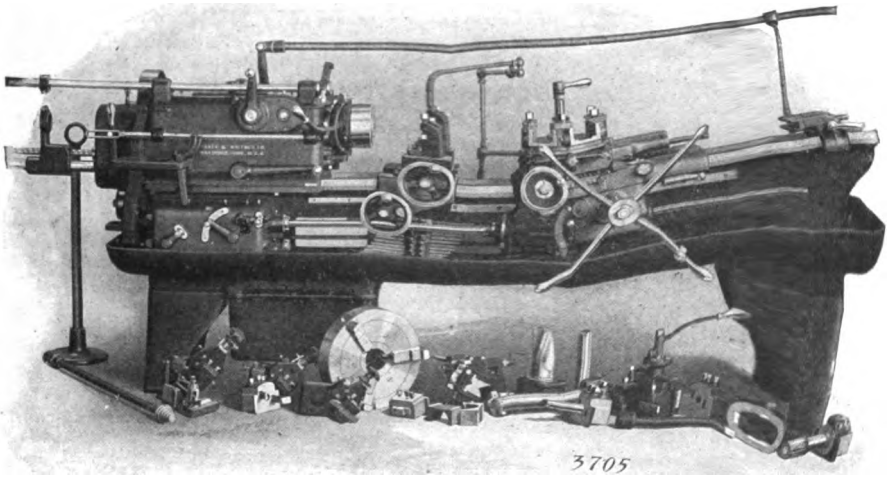
The OPEN TURRET LATHE

WITH CROSS-SLIDING TURRET

A Universal Machine for work on Bars, Forgings and Castings



2½ x 26 Pratt & Whitney Open Turret Lathe.

Machine has stiff geared head which is stationary and is arranged for constant speed drive either by direct connected motor bolted directly to the head or single pulley belted to countershaft.

Turret is mounted on a slide of generous proportions, and has both positive power-and hand-feeds in longitudinal and transverse directions.

Tool equipment is simple, efficient and universal.

The horizontal locking bolt has a distinct advantage over the vertical bolt as the tendency to lift the turret from its seat is absolutely obviated.

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KNECHT Bros. Co., Cincinnati, O.
MIAMI Valley Machine Tool Co., Dayton, O.
NATIONAL Machine Co., Hartford, Conn.
PRATT & Whitney Co., Hartford, Conn. (See page 131.)
PRENTICE Bros. Co., Worcester, Mass.
REED Co., Francis, Worcester, Mass.
ST. LOUIS Machine Tool Co., St. Louis, Mo.
SIBLEY Machine Tool Co., South Bend, Ind.
SIGOURNEY Tool Co., Hartford, Conn.

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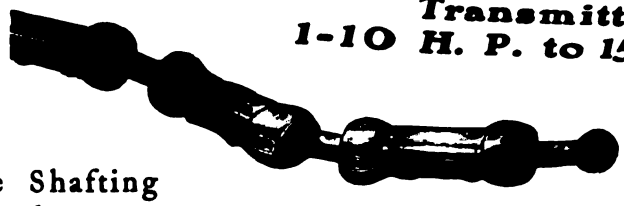
Transmitting 1-10 H. P. to 150 H. P.



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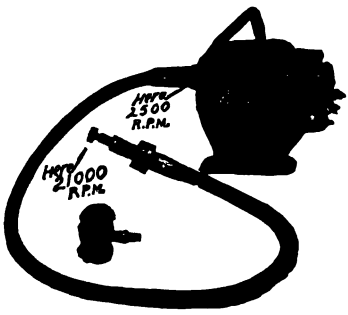

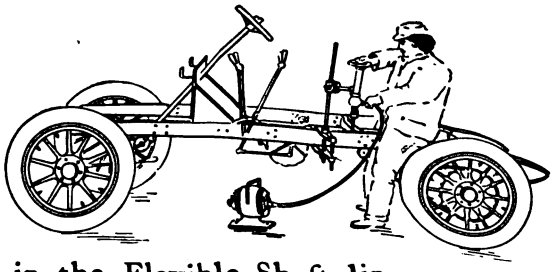

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WILLIAMS, White & Co., Moline, Ill.

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CHAMBERSBURG Engineering Co., Chambersburg, Pa.
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LANE Tool Co., Cleveland, O.
McDOUGALL & Potter Co., New York, N. Y.
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SELLERS & Co., Wm., Philadelphia, Pa.

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PRATT & Whitney Co., Hartford, Conn. (See page 131.)
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PRATT & W (See page
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PUTNAM M
RAHN-Carpe
REED Co., F
ROBBINS Ma
SCHUMACH
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are making a "big hit" with those who have used other instruments. The remarkable steadiness of the pointer under the severest road conditions is proving a revelation to all who use them. A beautiful piece of mechanism and a real truly, sure enough unbreakable flexible shaft are features that appeal to people who look into these matters.

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NATIONAL Machine Co., Milwaukee, Wis.
NILES-Bement-Pond Co., New York, N. Y.
POTTER & Johnston Machine Co., Pawtucket, R. I.
PRATT & Whitney Co., Hartford, Conn. (See page 131.)
PRENTICE Bros. Co., Worcester, Mass.
RAHN-Carpenter Co., Cincinnati, O.
REED Co., F. E., Worcester, Mass.
SCHUMACHER & Boye, Cincinnati, O.
SPRINGFIELD Machine Tool Co., Springfield, O.
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FAY & Scott, Dexter, Me.
FOX Machine Co., Grand Rapids, Mich.
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HOLMES Machinery Co., E. B., Buffalo, N. Y.
OBER Mfg. Co., Chagrin Falls, O.
OLIVER Mfg. Co., Grand Rapids, Mich.
PORTER, C. O. & A. D., Grand Rapids, Mich.
POWER & Co., L., Philadelphia, Pa.
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BINSEE Machine Co., Newark, N. J.
DAVIS Machine Co., W. P., Rochester, N. Y.

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Eliminate Carburetor Troubles

and increase the power of your engine by using —

THE STANDARD CARBURETOR

The STANDARD CARBURETOR is the simplest and most efficient on the market. Its novel and important feature is the **POSITIVE CONTROL** through two "butterfly" valves in the mixing chamber. One regulating the QUALITY of the mixture, and the other controlling the QUANTITY of the gas admitted to the engine. These two valves are mechanically connected and operate simultaneously, that is they always *move together.* Opening the throttle automatically opens the air valve, and vice-versa, so that the mixture is **ALWAYS KEPT UNIFORM.** The Standard is so far superior to all others that no owner or Automobile manufacturer or dealer should fail to investigate it thoroughly.

Stood perfect test in Glidden Tour, 1906.

WRITE US TO-DAY FOR FULL PARTICULARS

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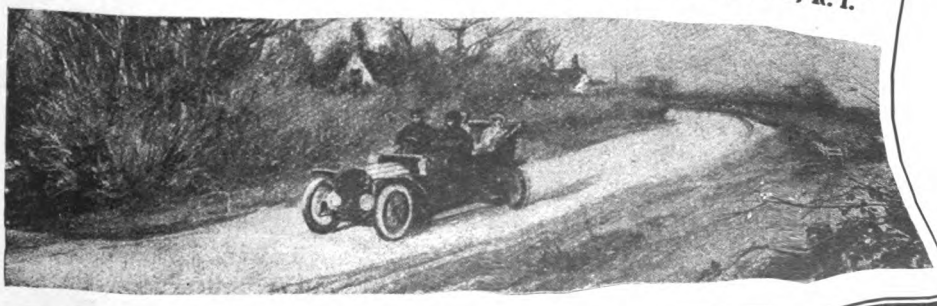

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KEY SEATING MACHINES

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MITTS & Merrill, Saginaw, Mich.
MORTON Mfg. Co., Muskegon Heights, Mich.
NILES-Bement-Pond Co., New York, N. Y.

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ADAMS Co., Dubuque, Ia.
BEAMAN & Smith Co., Providence, R. I.
BECKER-Brainerd Milling Machine Co., Hyde Park, Mass.
BROWN & Sharpe Mfg. Co., Providence, R. I.
CINCINNATI Milling Machine Co., Cincinnati, O.
FOSDICK Machine Tool Co., Cincinnati, O.
FOX Machine Co., Grand Rapids, Mich.
GARVIN Machine Co., New York, N. Y.
HENDEY Machine Co., Torrington, Conn.
INGERSOLL Milling Machine Co., Rockford, Ill.
KEARNEY & Trecker Co., Milwaukee, Wis.
KEMPSMITH Mfg. Co., Milwaukee, Wis.
LE BLOND Machine Tool Co., R. K., Cincinnati, O.
NILES-Bement-Pond Co., New York, N. Y.
OESTERLEIN Machine Co., Cincinnati, O.
OWEN Machine Tool Co., Springfield, O.
PRATT & Whitney Co., Hartford, Conn. **(See page 131.)**
SELLERS & Co., Wm., Philadelphia, Pa.

RIM FORMING AND ROLLING MACHINES

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PISTON RING MACHINES

(Semi Automatic)

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BALDWIN ELASTIC SPRING RECOIL CHECK

Avoid the jar and save the car. The only Check made on real correct principles. It will check the Recoil of the spring gradually so as to avoid any unnecessary vibration to the Parts of the car and allows the rider to sit in comfort on the seat while riding rapidly over rough roads.

Saves the springs and makes riding a pleasure.

All parts guaranteed for a season.

$60.00 per set of Four

Thirty days trial allowed.

THE BALDWIN NEW DETACHABLE CHAIN

is the most perfect of mechanical propositions in the way of Detachable Chain ever offered the trade.

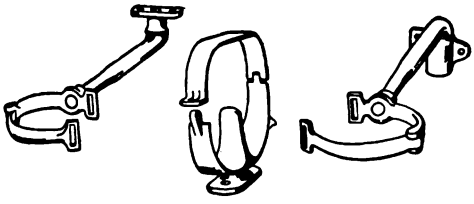
Superior to anything that has ever been put on the market in design.

Note the clothes-pin attachment, which, inserted in the slot in the head of the rivet forms a collar for retaining the side link. This is so broad that it makes a bearing against the side link which cannot be cut off or cannot come apart, and yet it is easily removable with the crudest tools by anyone. This collar is not a spring, but a fine grade piece of steel which will bear separation and compression for removing and attaching the same without breaking. It thus forms an ideal attachment.

For further particulars write the Company.

Prices the same as for all Automobile Chains.

McKINNEY REMOVABLE TIRE HOLDERS



The arms are connected with the fixtures on the car by a bayonet attachment so that they can be removed without the aid of bolts or nuts.

The jaws are adjusted for one or two tires.

We furnish Plain foot piece with strap or locking foot piece for single or double tires. These are an unusual, substantial, well-made article

Double Tire Holders, locking device, -	$14.00
Single Locking Device, - - -	$13.00
With Plain foot piece, - - -	$12.00
Two arms without foot piece - -	$10.00

We also have a lighter weight Tire Holder which we can sell for $9.00 per set, including the foot piece with strap. Send for particulars, etc.

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WHITNEY & Co., Baxter D., Winchendon Mass.

WOODS Machine Co., S. A., Boston, Mass.

YERKES & Finan Wood Working Machine Co., St. Louis, Mo.

PRESSES

BROACHING PRESSES

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LAPOINTE Machine Tool Co., Hudson, Mass.

PERKINS Machine Co., Warren, Mass.

STANDARD Machinery Co., Providence, R. I.

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ALLIANCE Machine Co., Alliance, O.

BAIRD Machine Co., Oakville, Conn.

BLAKE & Johnson Co., Waterbury, Conn.

BLISS Co., E. W., Brooklyn, N. Y.

CADY Machine Co., Cleveland, O.

CLEVELAND Punch & Shear Works, Cleveland, O.

CLEVELAND Stamping & Tool Co., Cleveland, O.

CONSOLIDATED Press & Tool Co., Hastings, Mich.

COULTER & McKenzie Machine Co., Bridgeport, Conn.

CROSS & Spiers Machine Co., Waterbury, Conn.

FERRACUTE Machine Co., Bridgeton, N. J.

HIBBARD Mfg. Co., Wm. H., Brooklyn, N. Y.

LEFFLER & Co., Chas., Brooklyn, N. Y.

LONG & Allstatter Co., Hamilton, O.

MANVILLE Bros. Co., Waterbury, Conn.

MANVILLE Machine Co., E. J., Waterbury, Conn.

MINER & Peck Mfg. Co., New Haven, Conn.

NIAGARA Machine & Tool Works, Buffalo, N. Y.

NILES-Bement-Pond Co., New York, N. Y.

PERKINS Machine Co., Warren, Mass.

ROBINSON Mfg. Co., J. M., Cincinnati, O.

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TOLEDO Machine & Tool Co., Toledo, O.

WATERBURY Farrel Foundry & Machine Co., Waterbury, Conn.

WATERBURY Machine Co., Waterbury, Conn.

WHEELER & Son, Frank, Meriden, Conn.

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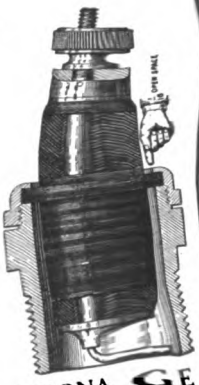
Are as good as the Name

MICA and PORCELAIN



See them Spark.
Note the Construction.
It is the Acme of Perfection.
The Result of Eight Years Practical Experience.

OUR BUSINESS IS TO MAKE SPARK PLUGS

We make them to meet the conditions required in the various makes of engines

AUTO, MARINE and STATIONARY

LET US KNOW YOUR WANTS. WE SOLICIT YOUR PATRONAGE
UPON THE QUALITY OF OUR GOODS DEPENDS OUR SUCCESS

IMPORTANT FEATURES

All plugs separable for cleaning.
No part of porcelains coming in contact with metal, they are free to expand and contract, and therefore will not break.
More non-short-circuiting space than any plug made.
Non-corrosive sparking points used.
No asbestos or wicking to blow out.
No shellac or cement used.
Solid turned stems.

OUR GUARANTEE—To use only highest grade materials obtainable. To replace any porcelains that prove defective through regular use. Prompt Shipments.

Representatives Wanted All Parts United States

ALL SIZES MICA $1.75 PORCELAIN $1.50

Special Discounts to Mfrs., Jobbers and Dealers

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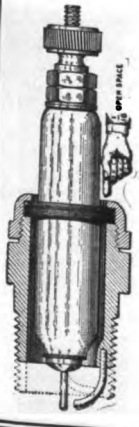
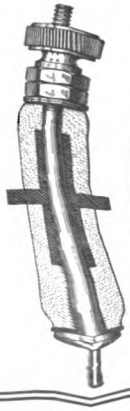


PATENTS PENDING — DIAMOND TRADE MARK — TRADE-MARK REGISTERED



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SAWS

BAND SAWING MACHINES

AMERICAN Saw Mill Machinery Co., Hackettstown, N. J.

AMERICAN Woodworking Machinery Co., New York, N. Y.

COLLADAY Co., Jos. O., Philadelphia, Pa.

CORDESMAN, Meyer & Co., Cincinnati, O.

CORDESMAN-Rechtin Co., Cincinnati, O.

CRESCENT Machine Co., Leetonia, O.

FAY & Egan Co., J. A., Cincinnati, O.

FOX Machine Co., Grand Rapids, Mich.

GOODSPEED Machine Co., Winchendon, Mass.

HALL & Brown Wood Working Machine Co., St. Louis, Mo.

MARSTON & Co., J. M., Boston, Mass.

OLIVER Machinery Co., Grand Rapids, Mich.

ROOT Co., B. M., York, Pa.

SILVER Mfg. Co., Salem, O.

SMITH Machine Co., H. B., Smithville, N. J.

WHITE Co., John A., Dover, N. H.

CIRCULAR SAW TABLES

AMERICAN Saw Mill Machinery Co., Hackettstown, N. J.

AMERICAN Woodworking Machinery Co., New York, N. Y.

BAKER Bros., Toledo, O.

BEACH, H. W., Montrose, Pa.

COLLADAY Co., Jos. O., Philadelphia, Pa.

CORDESMAN, Meyer & Co., Cincinnati, O.

FAY & Egan Co., J. A. Cincinnati, O.

FOX Machine Co., Grand Rapids, Mich.

GREENLEE Bros. & Co., Rockford, Ill.

HAYES Machine Co., Kingston, N. Y.

HEMINGWAY & Son, John, Lynn, Mass.

HERMANCE Machine Co., Williamsport, Pa.

HOLMES Machinery Co., W. B., Buffalo, N. Y.

MARSTON & Co., J. M., Boston, Mass.

OLIVER Machinery Co., Grand Rapids, Mich.

POWER & Co., L., Philadelphia, Pa.

ROOT Co., B. M., York, Pa.

SMITH Machine Co., H. B., Smithville, N. J.

U. S. Machine Co., Williamsport, Pa.

YERKES & Finan Woodworking Machine Co., St. Louis, Mo.

COLD SAW CUTTING OFF MACHINES

BILLINGS & Spencer Co., Hartford, Conn.

BIRDSBORO Steel Foundry & Machine Co., Birdsboro, Pa.

BURR & Sons, John T., Brooklyn, N. Y.

COCHRANE-Bly Co., Rochester, N. Y.

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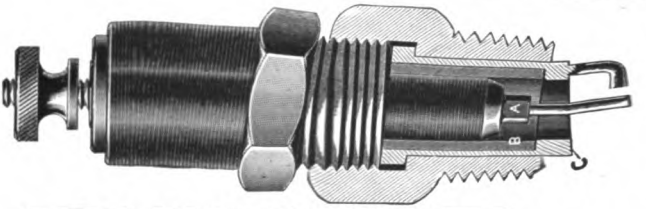
By Using

Wiley Mica Plug



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The "Wiley" mica spark Plug has many original features, one of which is its renewable cartridge. When Plug becomes dirty (as all Plugs will) the cartridge is removed and replaced by a new one. No delay en route. 1 plug and 1 extra cartridge equivalent to 2 plugs. **Price, $1.75. Extra Cartridges 25c each**

Manufacturers and Jobbers

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SELLS WHEREVER SHOWN

This **AUTO ANNUNCIATOR** is a device of the finest appearance, designed to communicate with the chauffeur of a closed car; its utility and perfect finish makes it the indispensable complement for the most elaborate limousine automobile; it is constructed of highly polished cast bronze, with inclined ruby glass on top, on which Signals appear, simultaneously with the ringing of an electric bell. The button box is covered with morocco leather, color to match the car.

Fitted with a Special 10 foot Silk covered cable of rubber insulated wires, absolutely waterproof, thus making it impossible to short-circuit.

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CINCINNATI Shaper Co., Cincinnati, O.
FLATHER Planer Co., Mark, Nashua, N. H.
GOULD & Eberhardt, Newark, N. J.
HAMILTON Machine Tool Co., Hamilton, O.
HENDEY Machine Co., Torrington, Conn.
KELLY Co., R. A., Xenia, O.
NEW Haven Mfg. Co., New Haven, Conn.
NILES-Bement-Pond Co., New York, N. Y.
OHIO Machine Tool Co., Kenton, O.
POTTER & Johnston Machine Co., Pawtucket, R. I.
PUTNAM Machine Co., Fitchburg, Mass.
QUEEN City Machine Tool Co., Cincinnati, O.
ROCKFORD Machine Tool Co., Rockford, Ill.
SELLERS & Co., Wm., Philadelphia, Pa.
SMITH & Mills, Cincinnati, O.
SPRINGFIELD Machine Tool Co., Springfield, O.
STEPTOE Shaper Co., John, Cincinnati, O.
STOCKBRIDGE Machine Co., Worcester, Mass.
WALCOTT & Wood Machine Tool Co., Jackson, Mich.

WOOD SHAPERS

AMERICAN Woodworking Machine Co., New York, N. Y.
COLLADAY Co., Jos. O., Philadelphia, Pa.
CORDESMAN, Meyer & Co., Cincinnati, O.
CORDESMAN-Rechtin Co., Cincinnati, O.
SMITH Machine Co., H. B., Smithville, N.J.
WHITNEY & Son, Baxter D., Winchendon, Mass.

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FARR
Conn
NATIC
NIAGA
N. Y
NOVE
PECK,
Conn.
ROBIN
WATE
Co.,
WRAY-

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CLEVE
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DAYTO
HELWI
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INGERS
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RELIAN
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Agent, advertise in THE AUT
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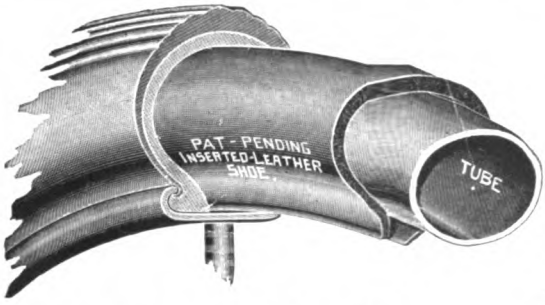

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No More Blow Outs

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This Shoe is absolutely Blow Out Proof.

Made of Pure Sole Leather only. We guarantee that there is no Fibre or Canvas in this shoe. It is made over a last the same as the shoe you wear on your foot. Each size tire has a last to conform with it, and each leather shoe fits the tire exact. Made in all tire sizes.

Try One In An Old Tire That You Are Casting Away
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Full Set Costs Less Than One New Tire. Interested?

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MAGNETOS

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APPLE—See Dayton Electrical Mfg. Co.

AUTO SPARKER—See Motsinger Device Mfg. Co.

BOSCH, Robert, 160 W. 56th St., New York, N. Y.

BROC-Barbier Auto Ignition Co., 143 W. 54th St., N. Y. City.

BULL DOG—See Ruprecht Electrical Co.

CARLISLE & Finch Co., 229-31 E. Clinton Ave., Cincinnati, O.

CHAMPION Co., Albert, 541 Tremont St., Boston, Mass. (Importers). "Gianoli."

D.-K. Electric Co., 106-110 Locust St., St. Louis, Mo. "Duncan."

DAYTON Electrical Mfg. Co., 87 St. Clair St., Dayton, O. "Apple."
(See page opposite.)

DOW Portable Electric Co., Adams St., Braintree, Mass. "Komet."

DUNCAN—See D.-K. Electric Co.

EISEMANN—See Lavalette & Co.

ELBRIDGE Electric Co., Elbridge, N. Y.

ENGINEERING Specialty Co., 143 Liberty St., New York, N. Y.

FAWN River Mfg. Co., Constantine, Mich.

GENERAL Electric Co., Schenectady, N. Y.

GIANOLI—See Champion Co.

GOODSON Electric Ignition Co., Providence, R. I.

HEINZE Electric Co., Lowell, Mass.
(See page 71.)

HENRICKS Novelty Co., 130 S. Capitol Ave., Indianapolis, Ind.

HERCULES Electric Co., 714 Langsdale Ave., Indianapolis, Ind. "Star."

HOLLEY Bros. Co., 661-73 Beaubien St., Detroit, Mich.

HOLTZER-Cabot Electric Co., Brookline, Mass.

K-W Ignition Co., 35 Power Ave., Cleveland, O.
(See page 169.)

KENDRICK & Davis, Lebanon, N. H.

KNOBLOCK-Heideman Mfg. Co., High St. & L. S. & M. S. Ry., South Bend, Ind. "Quick Action."

KOMET—See Dow Portable Electric Co.

LACOSTE—See Rubay, Leon.

LAVALETTE & Co., 112-114 W. 42d St., New York, N. Y. "Eisemann."

MIDLAND Supply Co., 1218 Michigan Ave., Chicago, Ill. "Wilson."

MOTSINGER Device Mfg. Co., 36 Main St., Pendleton, Ind. "Auto Sparker."

PEERLESS—See Tritt Electric Co.

PERFECTION Magneto Co., Anderson, Ind.

PITTSFIELD Spark Coil Co., Dalton, Mass.
(See page 73.)

QUICK ACTION—See Knoblock-Heideman Mfg. Co.

REMY Electric Co., Anderson, Ind.

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Only Plug on the market today making four fires at one and same time. Special grade of wire which will not scale, corrode, or open.

We use our new insulation called **Belleeko Porcelain,** one which is better than Mica, Lava or Porcelain.

Our insulation will not absorb or break easily under extreme heat.

Our plug can be taken apart and cleaned in five seconds.

Write for Prices, Agencies and Folders.

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KENT SPARK PLUG

TERMINAL A.

Wholly protected by the best grade of imported Porcelain.

TERMINAL B.

Double anchorage, assuring permanency of Gap. also best and strongest Spark without waste; extremely small vital surface exposed to soot, and oil accumulation so little that spark burns gap clean, therefore no short circuit.

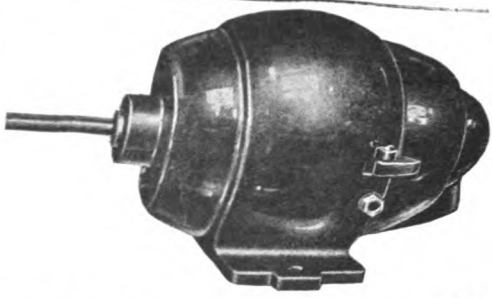
GUARANTEE

Any dealer is authorized to sell Kent Plugs with understanding that money refunded if not satisfactory; that's a square deal. If your dealer don't have them, don't take some "Just as good;" they won't be.

KENT SPARK PLUG CO., Inc.

Office 621 BROADWAY NEW YORK

Factory 1279 BEDFORD AVE. BROOKLYN, N. Y.



IT WILL OUT-LAST YOUR ENGINE

Apple Ignition Dynamos

in use to-day have given A 1 service for the last ten years.

This 1907 model is better than ever.

It retains many of the features of previous models which have proven so successful and it also possesses many new and remarkable improvements.

A 200 R.P.M. reduction in running speed is alone evidence of surprising advancement.

The Apple Ignition Dynamo can be used on any automobile, boat or stationary gas engine as a storage battery charger to complete the "Floating the battery on the line" system, or as an automatic sparker for starting and running engines without batteries.

It will pay you to investigate an ignition system that will do its work unfailingly as long as you run your engine.

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Free on request

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87 St. Clair Street DAYTON, OHIO

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RUBBER MATS (Continu

DIAMOND Rubber Co., Akron, O
(See page 225.)

EMPIRE Rubber Mfg. Co., Trenton,

GOODRICH, Co., B. F., Akron, O.

GOODYEAR Tire & Rubber Co., Akr

GOSHEN Rubber Works, Goshen, In

GOTHAM Rubber Co., 45 South St. York, N. Y.

HARTFORD Rubber Works Co., Ha Conn.

MANHATTAN Rubber Co., 18 Vesey S Y. City.

MECHANICAL Rubber Co., Cleveland, C

MONARCH Rubber Co., 41 N. 7th St., P delphia, Pa.

NEW JERSEY Car Spring & Rubber Wayne & Brunswick Sts., Jersey C N. J.

NEW York Belting & Packing Co., 91 Cha bers St., New York, N. Y.

NIAGARA Rubber Co., 1 Lock St., Loc port, N. Y. "Amazon."

PEERLESS Rubber Mfg. Co., 16 Warren S N. Y. City.

PENNSYLVANIA Rubber Co., Jeannett Pa.

TRENTON Rubber Mfg. Co., Trent N. J.
(See page 225.)

VICTOR Rubber Co., Springfield, O.

METALS

BEARING METALS

ADVANCE Mfg. Co., Todd Bldg., Kalamazoo, Mich.

AJAX Metal Co., Philadelphia, Pa.

ALLYNE Brass Foundry Co., Cleveland, O., Detroit, Mich., & Buffalo, N. Y.
(See page 61.)

AMERICAN Bronze Co., Berwyn, Pa. "Non-Gran." D

CLUM & Atkinson, 575 Lyell Ave., Rochester, N. Y. "Superior," "Plata." SI

COLUMBIA Smelting & Refining Works, 307 Water St., N. Y. City.

CRAMP & Sons' Ship & Engine Building Co., Wm., Philadelphia, Pa. "Parsons." DI

DAMASCUS Bronze Co., Pittsburg, Pa.

ELEPHANT—See Phosphor Bronze Smelting Co. (For

FAHRIG Metal Co., 316-22 Hudson St., New York, N. Y. JONI

GARDINER Metal Co., 454-56 W. Lake St., Chicago, Ill. VEEI

WINC

HUB Foundry & Plating Co., Ossining, N. Y. Yorl

LUMEN Bearing Co., Lathrop St., Buffalo, N. Y.
(See page opposite.)

MAGNOLIA Metal Co., 113-115 Bank St., N. Y. City. ADAMS

MERCHANT & Evans Co., Philadelphia, Pa. SCHAE

NON-GRAN—See American Bronze Co. Loro.

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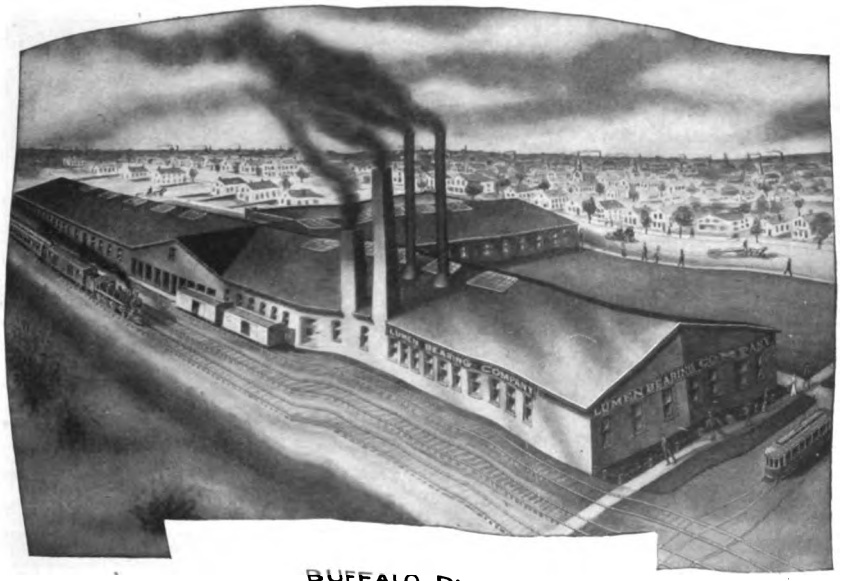

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(See Speedometers)

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ASHEVILLE Mica Co., Asheville, N. C.

BLACK Hills Mica Co., Auburn, N. Y.

CHICAGO Mica Co., Valparaiso, Ind.

FITZGIBBON Mica Co., 75 Park St., Beverly, Mass.

MICA Insulator Co., 218 Water St., N. Y. City.

MICA Manufacturing Co., 307 W. Broadway, N. Y. City.

MUNSELL & Co., Eugene, 218 Water St., N. Y. City.

SCHOONMAKER, A. O., 221 Fulton St., N. Y. City.

SILLS-Eddy Mica Co., Newark, N. J.

VANCE, D. T., Plumtree, N. C.

WATSON Bros., Foundry & Division Sts., So. Boston, Mass.

MIRRORS

ADJUSTABLE DASHBOARD MIRRORS

(To enable driver to see to the rear of the car)

ELECTRIC Signs & Signals Co., 177 1-2 East 87th St., N. Y. City. (See page 143.)

WATER GAUGE MIRRORS

KNOX Co., The Frank J., Hartford, Conn.

MONOGRAMS

ORNAMENTAL METAL MONOGRAMS

ABBOTT, W. H., 1263 Broadway, N. Y. City.

CHICAGO Art Metal Works, 67 Lake St., Chicago, Ill.

CHILDS & Co., S. D., 200 S. Clark St., Chicago, Ill.

COLGAN Co., J. W., Sudbury Bldg., Boston, Mass.

DUNN & Co., Thos. J., 161 Chambers St., New York, N. Y.

FINE, Horace E., Trenton, N. J.

GREENDUCK Co., 200 S. Clinton St., Chicago, Ill.

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

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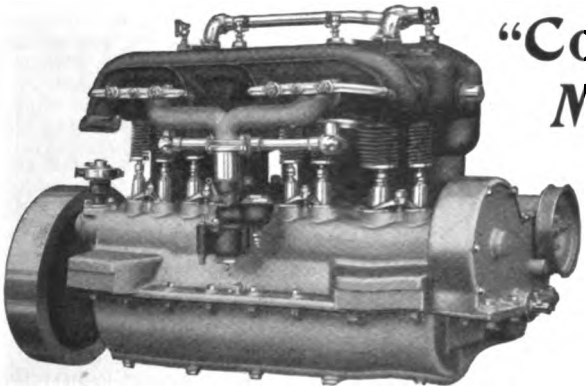

Type "HB" 4-cylinder motor, cylinders 5 in. bore, 5 in. stroke.

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Why not figure on buying your motors for 1908? We are in position to furnish three sizes of four cylinder motors, suitable for both light and heavy touring cars and roadsters as follows:—4 1-4 in. bore x 4 1-2 in. stroke; 4 3-4 in. bore x 5 in. stroke and 5 in. bore x 5 in. stroke.

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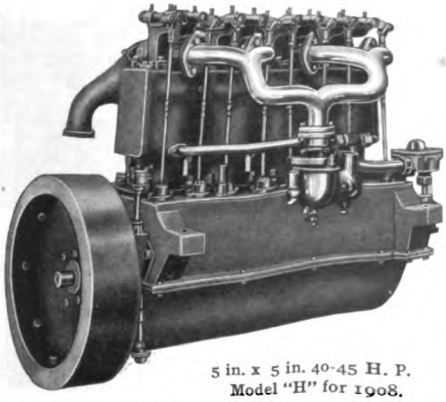

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Model "H" for 1908.

We build several sizes from our own designs.

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HANEY Gas Engine Co., Ligonier, Ind.

HARRINGTON-Wiard Co., Lieb & Wight Sts., Detroit, Mich.

HARVARD Marine & Auto Co., 25 Eliot St., Cambridge, Mass.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O.
(See page 5.)

HAYDEN Co., N. L., 172-82 W. Locust St., Columbus, O.

HERSCHELL-Spillman Co., North Tonawanda, N. Y.

HOFFMAN Launch & Motor Works, W., 1253 North Halstead St., Chicago, Ill.

HOULE Motor Works, A. J., 570-82 South East St., Holyoke, Mass.

ILLINOIS—See Moline Pump Co.

ILLINOIS Auto & Parts Co., Globe & Main Sts., Peoria, Ill.

JENCICK Motor Mfg. Co., Port Chester N. Y.

JONES Motor Co., Geo. H., 6th & Erie Sts. Camden, N. J.

KENNEBEC—See Torrey Roller Bushin Works.

KIRKHAM Motor Mfg. Co., Bath, N. Y.

LAUTH & CO., J., 528 Elston Ave., Chicag Ill.

MICHIGAN Automobile Co., Kalamazo Mich.

MILWAUKEE Auto Engine & Supply C 706-708 Winnebago St., Milwaukee, Wis.

MILWAUKEE Motor Co., 32d & Burlei Sts., Milwaukee, Wis.

MODEL Automobile Co., Peru, Ind.

MOLINE Pump Co., Third Ave. & 20th S Moline, Ill. "Illinois."

MURRAY, W. B., 1253 Milwaukee A Chicago, Ill.

NEER Air Cooled Engine Co., Plain City.

NORTH Chicago Machine Co., North C cago, Ill.
(See page 69.)

NORTHWAY Motor & Mfg. Co., 510-Maybury Grand Ave., Detroit, Mich
(See page 151.)

OSWALD Motor Co., 410 E. Washington Goshen, Ind.

PHILLIPS Motor Works, 405 Tacoma B Chicago, Ill.

PURITAN Machine Co., 97 Larned St. Detroit, Mich.

PUTNAM Motor Mfg. Co., 57 Lebanon Springfield, Mass.

QUEEN City Punch & Shear Co., 2 Lawrence St., Cincinnati, O.

REEVES Pulley Co., Columbus, Ind.

ROBERTS Motor Co., Clyde, O.

ROSS, H. S., 5607 So. Halsted St., Ch Ill.

RUTENBER—See Western Motor Co.

SCHLOSSER Mfg. Co., 151 E. 126th St. York City.

SPEED Changing Pulley Co., In apolis, Ind. "Carrico," "De Tan
(See page 227.)

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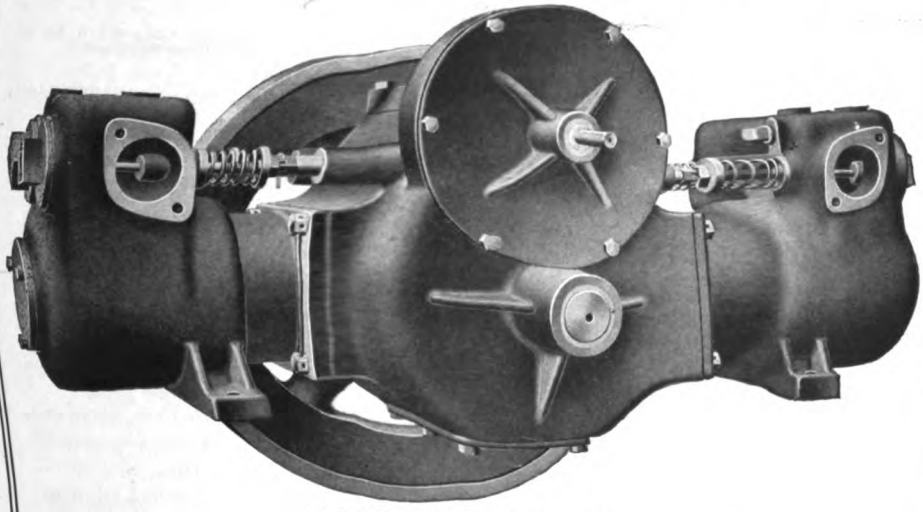

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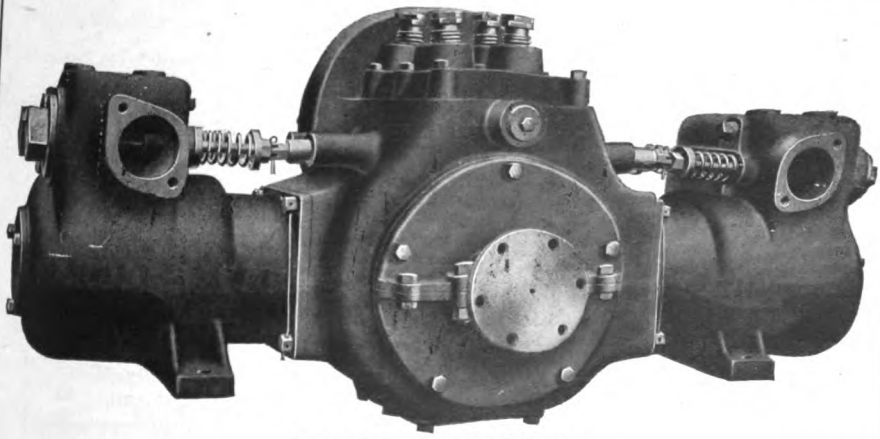
The A. Streit Machine Co.

Colerain & Arlington Avenues

CINCINNATI OHIO



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GASOLINE MARINE MOTORS
(Continued)

CROSS Engine Co., M. O., 800-06 Bellevue Ave., Detroit, Mich.

CROUCH & Co., Chas. P., 152 E. Lake St., Chicago, Ill.

CUSHMAN Motor Co., Lincoln, Neb.

DAVIS Mfg. Co., 267-273 6th St., Milwaukee, Wis.

DE MOOY Bros., 1831-36 E. 55th St., N. E., Cleveland, O.

DETROIT Auto Marine Co., 82 Congress St. E., Detroit, Mich.

DODD Motor Co., 106 Third St., Des Moines Ia.

DOMAN Co., H. C., Oshkosh, Wis.

DUCRO Mfg. Co., 1378 Niagara St., Buffal N. Y.

DUNN, Walter E., Ogdensburg, N. Y.

EASTERNHOUSE Engine Co., Taunto Mass.

ECHO Co., Delaware & Young Sts., Ton wanda, N. Y.

ERD Motor Co., Saginaw, Mich.

FAIRBANKS-Grant Mfg. Co., Ithaca, N.

FAIRBANKS, Morse & Co., Franklin Monroe Sts., Chicago, Ill.

FAIRFIELD Motor Co., 1047 Broad Bridgeport, Conn.

FAY & Bowen Engine Co., 92 Lake Geneva, N. Y.

FERRO Machine & Foundry Co., Wade Bldg., Cleveland, O.
(See page 243.)

FOWLER Machine Co., 1781 Middlesex Lowell, Mass.

FOX Reversible Gasoline Engine Co., F & Washington Sts., Newport, Ky.

FRISBIE Motor & Machine Works, W St., Middletown, Conn.

GAS Engine & Power Co. & Chas. L bury Co., Morris Heights, N. Y. City.

GOSHEN Motor Works, 9th St. & Li Ave., Goshen, Ind.

GRAND Rapids Gas Engine & Yacht Grand Rapids, Mich.

GRAY & Prior Machine Co., Hartford, C

GRAY Motor Co., Lieb & Larned Sts. troit, Mich.

HARVARD Marine & Auto Co., 25 Ellio Cambridge, Mass.

HASBROUCK Motor Works, 155 Wate New London, Conn.

HEINEL Co., H. A., Wilmington, Del.

HERSCHELL-Spillman Co., North wanda, N. Y.

HILDRETH Mfg. Co., 703 Sherida Lansing, Mich.

HOFFMAN Launch & Motor Work 1253 N. Halsted St., Chicago, Ill.

HOLLIDAY Mfg. & Engineering C Bunker St., Chicago, Ill.

HOLMES Motor Co., West Mystic, C

HOULE Motor Works, A. J., 570-8 East St., Holyoke, Mass.

HUBBARD Motor Co., Middletown "Victor."

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EFFICIENT—DURABLE—COMPACT

PERFORMANCE—not words—sells Beaver Motors. Perfect running balance, positive lubricating system, ample bearings, interchangeability of parts and uniform performance.

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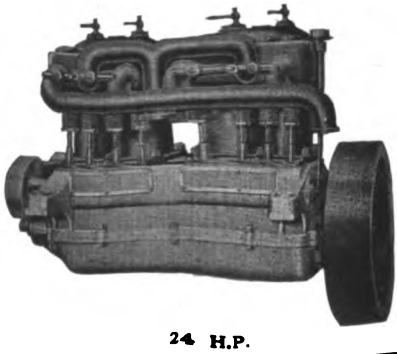

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Chief Eng'r

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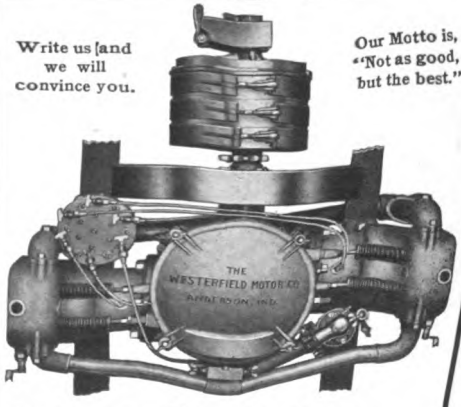
Write us and we will convince you.

Our Motto is, "Not as good, but the best."



Westerfield Motor

1908 Models

Double opposed, water cooled, 16-18 H. P. and 22-24 H.P., planetary transmission for either chain or shaft drive; gear circulating pumps; force feed oilers.

WESTERFIELD MOTOR CO.,
Main and Big 4, Anderson, Ind.

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GASOLINE MARINE MOTORS
(Continued)

STERLING Engine Co., 1250-60 Niagara St., Buffalo, N. Y.

STERLING Engine Co., 29 S. Clinton St., Chicago, Ill.

STERLING Engine Co., Fall River, Mass.

STORK Motor Co., Saginaw, Mich.

STREIT Machine Co., A., Colerain & Arlington Aves., Cincinnati, O.
(See page 153.)

SYMPHONY Mfg. Co., 26-28 Franklin St., Detroit, Mich.

TEMPLE Pump Co., 15th St. & 15th Pl., Chicago, Ill.

TERMAAT & Monahan Co., Oshkosh, Wis.

THOUSAND Island Boat & Engine Co., Morristown, N. Y.

TOCQUET Motor Co., Fourth Ave. & 24th St., New York, N. Y.

TORREY Roller Bushing Works, Bath, Me. "Kennebec."

TREBERT Gas Engine Co., 35 Ford St., Rochester, N. Y.

TRUSCOTT Boat Mfg. Co., St. Joseph, Mich.

TUTTLE Co., D. M., Canastota, N. Y.

UNITED Mfg. Co., 175 Woodbridge St., Detroit, Mich. "Little Giant."

VAN Auken Motor & Machine Works, Bridgeport, Conn.

VICTOR—See Hubbard Motor Co.

WATERMAN Marine Motor Co., Detroit, Mich.

WATKINS Co., Frank M., 525-31 Baymiller St., Cincinnati, O.

WATERTOWN Motor Co., 40 Moulton St., Watertown, N. Y.

WAUKESHA Motor Co., 120 North St., Waukesha, Wis.

WESTERN Launch & Engine Works, Michigan City, Ind.

WESTERN Motor Co., Logansport, Ind. "Rutenber."
(See page 57.)

WILLET Engine & Carbureter Co., 764 Ellicott Sq., Buffalo, N. Y.

WOLVERINE Motor Works, Foot of Union Ave., Bridgeport, Conn.

WRIGHT Motor Co., 48 S. Division St., Buffalo, N. Y.

KEROSENE MARINE MOTORS

ACME Oil Engine Co., Union Ave., near R. R., Bridgeport, Conn.

FAY & Bowen Engine Co., 92 Lake St., Geneva, N. Y.

GRAND Rapids Gas Engine & Yacht Co., Grand Rapids, Mich.

MIETZ, A., 138 Mott St., N. Y. City.

STEAM AUTOMOBILE MOTORS

(See Engines, Steam)

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EJECTOR MUFFLER

Fig. 1

Fig. 2

THE EJECTOR, MUFFLER, CUT-OUT VALVE AND FOOT PEDAL

Fig. 1 — Cutout Valve
Fig. 2 — Foot Pedal
Fig. 3 — The Muffler

A Muffler that Muffles

A muffler that will please you and that you can depend on to please your customers.

Designed and built on exclusive lines, it absolutely silences the explosions without taking power from the Motor but ACTUALLY INCREASING IT.

This may seem an out-of-the-ordinary combination, it is — because it is done by an *out-of-the-ordinary muffler*, but send your name and address *and we will prove it.*

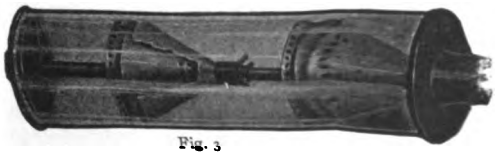
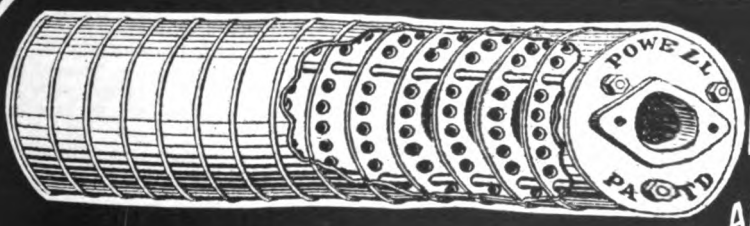


Fig. 3

Special inducements to manufacturers and live dealers to handle our muffler. Write to-day.

MOTOR AND MANUFACTURING WORKS CO., Middle St., Geneva, N. Y.



Eliminates ALL Noise

POWELL PRESSED STEEL MUFFLER

THE BEST MUFFLER ON THE MARKET

The Most Practical Scientific Application.
Quality and Workmanship Unexcelled.

This muffler is made up of a succession of pressed steel cups drawn from sheet metal of No. 16 gauge, each cup shouldered so that it overlaps the bottom of the succeeding one by ¼ of an inch. The number of cups used varying with the size of the engine to be muffled.

The end plates are of heavily ribbed gray or malleable iron, with pipe or flange connection. The perforations are around the outer edge of each baffling plate with an additional one in the center of the first few. The area of these holes varying with the size of engine to be muffled.

In ordering state size of engine cylinder and number, size of exhaust pipe and whether standard pipe, steel or flanged connection is used.

POWELL MUFFLER & TIMER CO.
42 La Fayette Street UTICA, N. Y.

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EXHAUST MUFFLERS (Continued)

RUNYEN, Benj., Redkey, Ind.

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

SMITH & Co., D. B., Utica, N. Y. "Yankee."

SNOW, B. W., 132 Bissell St., Syracuse, N. Y.

TURNER Brass Works, Sycamore, Ill. (See page 205.)

WEEBER Mfg. Works, C. F., 170-172 Central Ave., Albany, N. Y.

WESTERN Motor Co., Logansport, Ind. (See page 57.)

YANKEE—See Smith & Co.

THROAT MUFFLERS

SCOTT Muffler Co., 71 Gallia St., Portsmouth, O.

VISOR Knitting Co., 2016 Whirlpool Ave., Niagara Falls, N. Y.

WAY Muffler Co., 23d & Arch Sts., Philadelphia, Pa.

NAILS

UPHOLSTERY NAILS

(See Tacks, Upholstery)

NIPPLES

PIPE NIPPLES

(See Fittings, Pipe)

PUMP NIPPLES

(See Connections, Tire Pump)

NUMBERS

LICENSE NUMBERS OR HANGER

ALUMINUM Mfg. Co., Two Rivers, Wis.

BALTIMORE Enamel & Novelty Co., foot Allen St., Baltimore, Md.

BALZER, Gus, 1556 Broadway, New Yor N. Y.

BOYLE & Co., John, 112-14 Duane St., N. City.

CHILDS & Co., S. D., 200 S. Clark St., Cl cago, Ill.

DENTZEAU, Geo., 896 8th Ave., New Yo N. Y.

DUNN & Co., Thos. J., 101 Chambers S New York, N. Y.

FINE, Horace E., Trenton, N. J.

GREACON & Co., Walter, 12 Mechanic Newark, N. J.

INDIANAPOLIS Dash Co., 2116 S. Merid St., Indianapolis, Ind.

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ASBESTOS AND FIBROUS PACKING (Continued)

EAGLE Oil Supply Co., 104 Broad St., Boston, Mass.

GARLOCK Packing Co., Palmyra, N. Y.

HART Packing Co., Boston, Mass.

JOHNS-Manville Co., H. W., 100 William St., New York, N. Y.

KEASBY & Mattison Co., Ambler, Pa.

MORGAN & Wright, Detroit, Mich. (See page 217.)

PEARSON & Co., J. H., 122 Centre St., Nev York, N. Y.

ROBERTSON & Sons, Jas. L., 48 Warrei St., New York, N. Y.

METALLIC PACKING

(See Gaskets, Meta lic)

RUBBER PACKING

AMERICAN Steam Packing Co., 51 High S Boston, Mass.

BOSTON Belting Co., 104 Broad St., Bostc Mass.

BOSTON Woven Hose & Rubber Co., India St., Boston, Mass.

BOWERS Rubber Co., San Francisco, Cal

BRANDT, Randolph, 70 Cortlandt St., N York, N. Y.

CANFIELD Mfg. Co., 1112 Noble St., Phi delphia, Pa.

COMBINATION Rubber & Belting (Bloomfield, N. J.

CONSOLIDATED Rubber Co., Trenton, N

CONTINENTAL Rubber Works, Erie, Pa

CRANDALL Packing Co., Palmyra, N. Y

CRESCENT Belting & Packing Co., Tren N. J.

EAGLE Oil & Supply Co., 104 Broad Boston, Mass.

EMPIRE Rubber Mfg. Co., Trenton, N. .

GARLOCK Packing Co., Palmyra, N. Y.

GOODSELL Packing Co., 23 S. Canal Chicago, Ill.

GOODYEAR Tire & Rubber Co., Akron,

GOSHEN Rubber Works, Goshen, Ind.

GUTTA Percha & Rubber Mfg. Co., Duane St., New York, N. Y.

HAMILTON Rubber Mfg. Co., Trenton,

HART Packing Co., Boston, Mass.

KNOWLTON Rubber Co., Geo. W., 88] St., Boston, Mass.

MANHATTAN Rubber Mfg. Co., New N. Y.

MECHANICAL Rubber Co., C. & P.] near Nickel Plate R. R., Cleveland, C

MORGAN & Wright, Detroit, Mich. (See page 217.)

NATIONAL India Rubber Co., Bristol,

NEW Jersey Car Spring & Rubber Co., Ave., cor. Brunswick St., Jersey City

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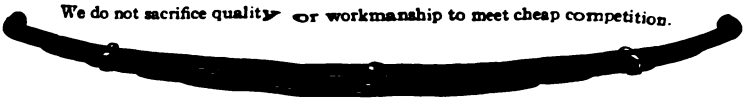
AUTOMOBILE LEAF SPRINGS

We do not sacrifice quality or workmanship to meet cheap competition.

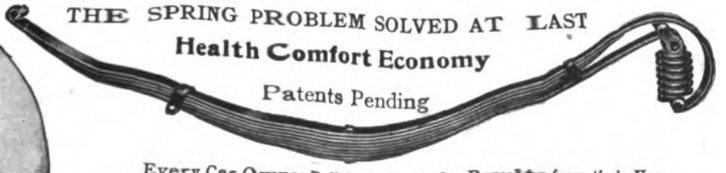


Every spring is rigorously tested, inspected and recorded, so that a duplicate can be secured at any time
We have crucible steel, experienced, highest skilled mechanics and up-to-date equipment.

Established 1880.

TUTHILL SPRING CO., 213 W. Polk Street, Chicago.

Liberal Discount to Dealers.



Every Car Owner Delighted with the Results from their Use.

SELLS ON SIGHT BECAUSE OF THE FOLLOWING ADVANTAGES

Vibration absorbed. Life of tires prolonged whether over rough roads or smooth. Life and efficiency of engine increased 50 per cent. Less road resistance. Greater speed. Less fuel. Uniform tension, hence no broken side springs. Nothing to get out of order. No small parts to adjust or oil

TRIPLE ACTION SPRING CO. 1254 Michigan Ave. **Chicago, Ill.**

C. A. Willey Company

HUNTER'S POINT

NEW YORK CITY

Manufacturers of... **COLORS** *Especially for....*

Automobiles and Filling-up Specialties

FOR BOTH METAL AND WOOD BODIES

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ENAMEL PAINTS

ACME White Lead & Color Works, Detroit, Mich.

ADAMS & Elting Co., 155 Washington Blvd., Chicago, Ill.

ARNSTEIN Eugene, 35th St. & Shields Ave., Chicago, Ill.
(See page 79.)

BUFFALO Enamel & Stain Co., D. S. Morgan Bldg., Buffalo, N. Y.

DETROIT White Lead Works, 532 Milwaukee Ave., E., Detroit, Mich.

DEVOE & C. T. Raynolds Co., F. W., New York, N. Y.

FELTON, Sibley & Co., 136-140 North Fourth St., Philadelphia, Pa.

FOREST City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O.

GLIDDEN Varnish Co., Rockefeller Bldg., Cleveland, O.

MASURY & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

PATTERSON-Sargent Paint Co., Prospect and Huron Sts., Cleveland, O.

SCHRACK & Co., C., 152 N. Fourth St., Philadelphia, Pa.

SHERWIN-Williams Co., 100 Canal St., Cleveland, O.

STANDARD Varnish Works, 29 B'way, N. Y. City.
(See page 181.)

VALENTINE & Co., 257 Broadway, N. Y. City.

PANELS

CHARGING PANELS AND SWITCHBOARDS

ANDERSON Mfg. Co., Albert & J. M., Bo ton, Mass.

ANDRAE & Sons, Julius, Milwaukee, Wis.

CUTLER-Hammer Mfg. Co., Milwauk Wis.

GENERAL Electric Co., Schenectady, N.

KRANTZ Mfg. Co., H., Brooklyn, N. Y.

LA ROCHE Co., F. A., New York, N. Y.

LEONARD Electric Co., Ward, 30 Pe field Road, Bronxville, N. Y.
(See page 181.)

METROPOLITAN Switchboard Co., York, N. Y.

SCHUREMAN & Co., J. L., Chicago, Ill

WESTERN Electric Co., Chicago, Ill.

WIRT Electric Co., 3108 Germantown Philadelphia, Pa.

WOOD PANELS

AMERICAN Veneer Co., 666 Marl Kenilworth, N. J.
(See page 41.)

DANN Bros. & Co., 80-88 Franklin Haven, Conn.

OHIO Scroll & Lumber Co., Coving

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MILLER BROS., Amesbury, Mass.

Builders of High-Grade
LIMOUSINE, LANDAULETTE
TOURING, RUNABOUT
and
RACING BODIES
IN THE WHITE
or FINISHED
COM-
PLETE

BODIES

We employ a large force of first class workmen and are prepared to figure with you on your requirements for any of the above styles of bodies in high grade only

Prompt Deliveries Guaranteed

MILLER BROS., Amesbury, Mass.

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TIRE REPAIR PATCHES (Continued)

DIAMOND Rubber Co., Akron, O.
(See page 225.)

EMPIRE Automobile Tire Co., Trenton, N. J.

ENTERPRISE Rubber Co., 110 Federal St., Boston, Mass.

G & J Tire Co., 549 E. Georgia St., Indianapolis, Ind.

HARTFORD Rubber Works Co., Hartford, Conn.

INNER Shoe Tire Co., 64 Moore St., Grand Rapids, Mich.

MORGAN & Wright, Detroit, Mich.
(See page 217.)

NIAGARA Rubber Co., 1 Lock St., Lockport, N. Y. "Amazon."

TINGLEY & Co., Chas. O., Rahway, N. J.

TRAVER Blow-out Patch Co., 1265 Broadway, N. Y. City.
(See page 89.)

TRENTON Rubber Mfg. Co., Trenton, N. J.
(See page 225.)

PATTERNS

AUTOMOBILE PATTERN MAKERS

BALKWILL Pattern Works, 1449 E. 49th St., Cleveland, O.

FORSYTH Pattern Co., Youngstown, O.

HARTFORD Pattern & Model Co., 120 Allyn St., Hartford, Conn.

MODEL Pattern Works, Washington & Perry Sts., Buffalo, N. Y.

STANDARD Pattern Works, Detroit, Mich.

PEDALS

RATCHET PEDALS

(For locking brakes, etc.)

GARAGE Equipment Co., 201 22d St., Milwaukee, Wis. "Perfect."

PERFECT—See Garage Equipment Co.

READING Automobile Co., 26 S. Fifth St., Reading, Pa. "Victor."

TURNER Brass Works, Sycamore, Ill.
(See page 205.)

VICTOR—See Reading Automobile Co.

PINIONS

METAL AND RAWHIDE PINIONS

(See Gears)

BROC
CLIM
COBE
HIND
JENC
NATI
PICK
SMIT
WHIT
WIRE
ter.

WRO

BYER
CRAN
HARR
Harr
LA BI
LONG
MARK
NATI
York
READ
SOUT
SPAN
Ave.
UNITI
burg
WEST
YOUN
towr

EXH

ABBO
ALUM
BALTI
Allen
BECK
tic A
BLACI
Falls,

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If your engine trouble has its source in ignition, there's one sure remedy,

A WITHERBEE BATTERY

Whether your engine is an automobile or marine type, so long as it requires a spark for ignition, a Witherbee Battery is absolutely essential. You cannot get the maximum power, the maximum service, the smooth running qualities and the absence of vibration with any gasoline motor unless its ignition is perfect.

A high-priced engine with poor ignition gives you less power and service than a cheap engine with perfect ignition.

THE WITHERBEE BATTERY SUPPLIES PERFECT IGNITION

Write for Booklet 8, it tells of ignition troubles, the causes and remedies. It's free and valuable to every owner of a motor.

WITHERBEE IGNITER COMPANY

541 West 43rd Street
NEW YORK CITY

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1426 Michigan Ave.	510 Continental Bldg.	260 Jefferson Ave.

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NAME PLATES (Continued)

BUCKEYE Iron & Brass Works, 324 E. Third St., Dayton, O.

CHANDLER Co., 31 Taylor St., Springfield, Mass.

CHILDS & Co., S. D., 200 S. Clark St., Chicago, Ill.

CROWE Name Plate & Engraving Co., 71 W. Jackson Blvd., Chicago, Ill.

DETROIT Rubber Stamp Co., 99 Griswold St., Detroit, Mich.

EASTWOOD Wire Mfg. Co., Belleville, N. J.

ENGLISH & Mersick Co., 70-74 Crown St., New Haven, Conn.

ELECTRO-Chemical Engraving Co., 450 19th St., Brooklyn, N. Y.

GREACON & Co., Walter, 12 Mechanic St., Newark, N. J.

GREENDUCK Co., 200 S. Clinton St., Chicago, Ill.

HANSON, C. H., 44 Clark St., Chicago, Ill.

IMPERIAL Brass Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill.
(See page 57.)

MONOGRAM Crest & Sign Co., 1556 Broadway, New York, N. Y.

MORSE & Son, C. H., 13 So. Water St., Rochester, N. Y.

MURDOCK-Shaw Co., 125 Federal St., Boston, Mass.

MURDOCK Co., Jas., Jr., 116 Opera Place, Cincinnati, O.

NEW YORK Stencil Works, 100 Nassau St., New York, N. Y.

QUINT & Sons, S. H., 15 So. 4th St., Philadelphia, Pa.

REES, F. H., Steele Memorial Bldg., Elmira, N. Y.

ROBBINS Mfg. Co., John, 58 Kneeland St., Boston, Mass.

ROGERS, C. E., 34 Beach St., Boston, Mass.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich.
(See page 223.)

SMITH Mfg. Co., R. H., Springfield, Mass.
(See page 195.)

STAFFORD Co., N., 67 Fulton St., New York City.

TURNER Brass Works, Sycamore, Ill.
(See page 205.)

WALTER & Sons, N. C., 194 William St., N. Y. City.

WHITEFORD & Co., Jos. G., 23-27 N. Jefferson St., Chicago, Ill.

PLATING

BRASS AND NICKEL PLATING

BRIDGEPORT Electro Plating Co., Bridgeport, Conn.

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

IDEAL Plating Co., 3 Appleton St., Boston, Mass.

PECKHAM, John A., 956 Grand Ave., New Haven, Conn.

TRESAL Bronzing & Plating Co., 245-47 W. 28th St., New York, N. Y.

AMER
Ave.,
BAKE
(See
BISHO
CROSE
St., N
(See
GOLDS
63-65
PLATT

CHAR

ELECT

ACME—
ALBRIG
AMERIC
Foxbo
AMERI
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ANDER
APPLE—
ARC Sp
York, I
ARC-Tol
St., To
ATLANT
Binford
AUTO A
ark, N.
AUTO N
BAIRD-I
way, N
BEAT-E
BENFOR
Mount
BIG 4 S
Detroit
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BOUGIE-
BREECH
BROWN—
CATARA
CHAMPI
Boston,
CHARTE
Ill.
COMET—
DAYTON
St., Day
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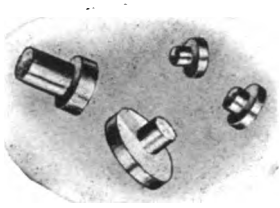

PLATINUM

Platinum and Platinum-Iridium Rivets and Contacts for Spark Coils and Plugs.

A large variety of rivets, soft or hard, for all electrical purposes; any percentage of iridium required.

CROSELMIRE & ACKOR CO., 40 Walnut St., Newark, N. J.

American Machine Mfg. Co.

Manufacturers of

PERFECTION SPARK PLUGS

The Best Mica Plug on the Market, Price, $1.00

WORKS, SOUTH BRAINTREE, MASS.

Office, 41 Lewis Wharf, BOSTON, MASS.

"VULCAN" Type Porcelain insulated Separable shell ½" pipe thread size, **Price, $1.25**

STA-RITE "STAYS RIGHT THE LONGEST"

Trade Mark Registered, U. S. Patent Office.

"Stays Right the Longest"

Made to **use.** We sell them, but that's another subject. You wish to please **your** customers by selling reliable goods.

One of our customers writes:

"I have tried all the plugs on the market all the way from 40 cents to $4.75 each and found none to give the service I get from Sta-Rites. Have had some of them in use 25 months, yet are good as new."

(His name is Mr. J. B. Benoit, Benson, Minn. Just send him a return card, and see if this is a "home-made" testimonial. We don't have to use that kind.)

It's careful workmanship, good materials and "Sta-Rite" double porcelains that hold business. Liberal advertising helps get it. Handsome wall sign free to dealers (while they last). Try a sample lot and see how you like our way, "The Sta-Rite Way," of doing business. Address

"VENUS" Type Mica insulated Separable shell ½" pipe size **Price, $1.50**

The R. E. Hardy Co., 86 Watts Street, New York City

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SPARK PLUGS (Continued)

DELTA Mfg. Co., Bloomfield, N. J.

DE LUXE Mfg. Co., Buffalo, N. Y.

DIAMOND—See Willyoung Appliance Co.

DIEBEL, Wm., 904 Lippincott Bldg., Philadelphia, Pa.

DOW Portable Electric Co., Adams St., Braintree, Mass.

DUPLEX Ignition Co., 307 W. 36th St., New York, N. Y.

ELBRIDGE Electric Co., Elbridge, N. Y.

EMPIRE—See Grant Mfg. & Machine Co.

EXCELSIOR Spark Plug Co., Cleveland, O.

FISCHER Special Mfg. Co., 2076 Reading Rd., Cincinnati, O. "Standard."

FLASH LIGHT—See Janney, Steinmetz & Co.

FOURFORONE Spark Plug Co., 23 E. Lake St., Chicago, Ill.

FRY Co., T. C. & W. L., 800 Chestnut St., Rochester, Pa.

FULMER, C. F., Plainfield, N. J.

GRANT Mfg. & Machine Co., 90 Silliman Ave., Bridgeport, Conn. "Empire."

H.-P.—See Auto Novelty Co.

HARDY Co., R. E., 86 Watts St., N. Y. City. "Sta-Rite," "Venus," "Vulcan."
(See page 167.)

HEINZE Electric Co., Lowell, Mass.
(See page 71.)

HERBERT & Franchi, 3312 Wabash Ave., Chicago, Ill. "Little Giant."

HERZ & Co., 203-05 Lafayette St., New York, N. Y. "Bougie-Mercedes."

HOLSTEN—See Triumph Engineering Co.

HUB Lubricator Co., Portland Bldg., Boston, Mass. "Wiley."
(See page 143.)

HUTTON, W. E., 350 Fulton St., Brooklyn, N. Y. "Anderson."

JANNEY, Steinmetz & Co., Fourth & Market Sts., Philadelphia, Pa. "Flash Light."
(See page 277.)

JEFFERY-Dewitt Co., Newark, N. J. "Reliance."
(See page 287.)

JEWELL—See Pittsfield Spark Coil Co.

K-W Ignition Co., 35 Power Ave., Cleveland, O. "Vim."
(See page opposite.)

KANGAROO—See Tritt Electric Co.

KENT Spark Plug Co., 621 Broadway, N. Y. City.
(See page 147.)

KINGSTON—See Kokomo Electric Co.

KOKOMO Electric Co., Kokomo, Ind. "Kingston."

LACOSTE—See Rubay, Leon.

LIPMAN Mfg. Co., 210 Pleasant St., Beloit, Wis.

LITTLE GIANT—See Herbert & Franchi.

McCANNA Mfg. Co., 56 N. Jefferson St., Chicago, Ill.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 127.)

METAL Specialties Mfg. Co., 18-24 W. Randolph St., Chicago, Ill.

MEZGI
N. Y
MOSLI
York,
"Bea
NEVEI
Mich.
(See
NORTI
St., N
NUPOI
OAKES
Mass.
PEERL
St., C
PERFE
Co.
PITTSI
Mass.
(See
PROGR
Torrir
RAJAH
St., N
RELIAN
RICH-S
Co.
RICHAI
St., H
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ROBER
Detroi
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ROCHE
RUBAY.
N. Y.
SCHUG
Ave., I
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SEIDLE
Jeffers
(See p
SHAIN,
N. Y.
SHUR-F
SOOT PI
SOOTLE
SPIT FIR
SPLITDO
New Y
(See pa
STANDA
STA-RIT
STANDA
"Breech
(See pa
THURST
cago, Ill
TRITT
Union C
TRIUMPH
TRIUMPH
St., New
UTILITY-
VENUS—
VIM—See
VULCAN-
W. E. B.—
WICO—Se
WILEY—S
WILLIAM
Syracuse,

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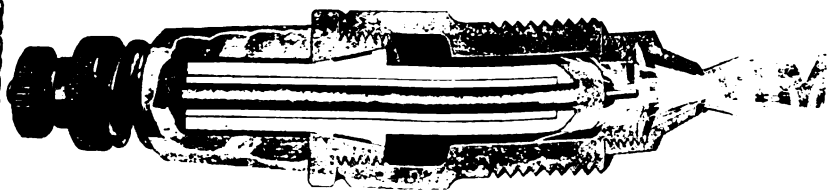

THE IMPROVED VIM Spark Plug

MR. DEALER:

The market is full of spark plugs—some good, but most of them otherwise. It behooves you, Mr. Dealer, to sell **THE BEST**—a plug that not only affords you a fair profit, but one that will give you a reputation and build up your business.

THE "VIM" IS THAT KIND OF A PLUG

It is much quicker than the ordinary plug. Actually shoots a blast of flame through the entire mixture, producing instantaneous ignition.

SOOT PROOF, OIL PROOF, TROUBLE PROOF, NO PACKING

Accurately ground taper joints prevent leaking.

NO CRACKED PORCELAINS

A spring at the end takes up the expansion from heat. Two porcelains and one mica tube make it the best insulated plug on the market.

OUR GUARANTEE

Ten per cent. more power or your money refunded. Price **$2.00** postpaid. With liberal discount to dealers. Write to us.

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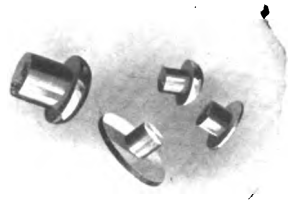
Ask about our Magnetos and Master Vibrator

Iridio-Platinum Rivets and Wire



RIVETS for use as contact points in spark coils and other electrical apparatus requiring a non-oxidizing surface. Any styles made to order.

WIRE furnished in all sizes, cut to special length, etc.

We also make Jump Spark Platinum Wires and Platinum Ignition Tubes, and Platinum Work in all forms

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PLATINUM NEWARK, N. J.

New York Office, 120 Liberty St.

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SPARK PLUGS (Continued)

WILLYOUNG Appliance Co., Ludlow Station, Yonkers, N. Y. "Diamond." (See page 141.)

WITHERBEE Igniter Co., 541 W. 43d St., New York, N. Y. "Wico." (See page 165.)

TIRE REPAIR PLUGS

APSTEIN, D., Bridgeport, Conn.

AUTO Goods Co., Boston, Mass. "Cinch." (See page 273.)

CINCH—See Auto Goods Co.

DIAMOND Rubber Co., Akron, O. (See page 225.)

HARTFORD Rubber Works Co., Hartford, Conn.

ENTERPRISE Rubber Co., 110 Federal St., Boston, Mass.

GOODRICH Co., B. F., Akron, O.

HUNTINGTON Automobile Co., Huntington, N. Y. "P. D. Q." (See page opposite.)

P. D. Q.—See Huntington Automobile Co.

TINGLEY & Co., Chas. O., Rahway, N. J.

POINTS

SPARKING POINTS

(See also Platinum)

AMERICAN Platinum Works, 251 N. J. R. R. Ave., Newark, N. J.

BAKER & Co., Newark, N. J. (See page 169.)

BOKER & Co., Herman, 101 Duane St., New York, N. Y. (Importers). "Meteor."

CROSELMIRE & Ackor Co., 40 Walnut St., Newark, N. J. (See page 167.)

IDIUM Metals Co., Boston, Mass.

MANHATTAN Dental Co., Times Bldg., New York, N. Y.

QUEEN & Co., 8th & Arch Sts., Philadelphia, Pa.

POLISHES

AUTOMOBILE BODY POLISHERS

(See also Soaps, Automobile Body)

ADAMS & Elting Co., 155 Washington Boulevard, Chicago, Ill.

AUTO Shine Co., Buffalo, N. Y.

AUTOSHINE—See Royal Polish Co.

BUFFALO Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.

CLEANOLA Co., Fulton Bldg., Pittsburg, Pa.

HATT Polish & Chemical Co., Chas. E., 388 Michigan Ave., Detroit, Mich.

HOLLINGSHEAD Co., R. M., Camden, N. J.

JEWEL Mfg. Co., Chicago, Ill.

KLENZENE Co., 1710-1712 Market St., Philadelphia, Pa

MAJESTIC—See Royal Lubricating Oil Co.

MODOC C
Pa.

NEWBER
adelphia,

NOXALL
Philadel

O. K.—See

ORIENT
Mass.

ROYAL L
New Yo

ROYAL P
cago, Ill.

**SHEPPAR
Newark,
(See pa**

ACME Po
burg, Pa

ADAMS &
Chicago,

ALLERS
New Yor

ALBRIGH

AMERICA
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AMERICA

AMERICA
St., New

ANCHOR

A-O-K—Se

AUTO BRI

AUTO-SHI

AUTO Oil
Mich.

AYROLITE

BADGER
Milwauke

BAR BOYS
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BELL Mfg
Mo. "Sta

BOTT Bro
Columbus

CHILDS C
York, N.

CLEANER
Mo.

CROSS, W
N. Y. "G

CROWN—S

EAGLE M
land, Ohi

FAIRCHILI
St., Chica

GILT EDGI

GLOBE—Se

GRAMLICH
Detroit, M

HARVEY
"America

**HARRIS O
St., Provi
(See cove**

HASSLER
Ave., Chic

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EVERYTHING

SEEMS BRIGHTER THIS YEAR

CLEANS POLISHES

LIQUID AND PASTE

SILVER NICKEL COPPER BRASS

SOLD EVERYWHERE

"GLOBE" METAL POLISH

HAS BECOME BETTER KNOWN

RAIMES & CO., 50 Ferry St., NEW YORK

NEW YORK SPORTING GOODS CO.

17 WARREN ST. NEW YORK, U.S.A.

Our 1907 Catalogue No. 37 is ready and you are invited to write for a copy. It will tell you about the best in

AUTOMOBILE SUPPLIES

—supplies that give real satisfaction, and at prices that will satisfy you, too. Dealers will please enclose their cards

Bicycles

Our trade in Bicycles and Sundries is the largest in New York and when you see our 1907 Catalogue No. 38 and our low net prices you will know why. We are "Middle East" distributors of the well-known D. & J. Hudson Wheels.

Will you write us?

NEW YORK SPORTING GOODS Co.

41144 N Y

17 WARREN ST. NEW YORK U.S.A.

Nothing else so quick and sure

P. D. Q. TIRE REPAIR PLUG

NO CEMENT NEEDED

Nothing else so cheap and lasting

Full Size, 1 1-4 Inch.

Punctures repaired quickly and permanently

Full Size, 1 1-2 Inch.

A quick relief for Tire Trouble

TO BE INSERTED AS SHOWN ABOVE

NO TIME LOST waiting for cement to dry. No leaky patches. Tight, permanent repairs.

Box containing four 1¼-inch P.D.Q. Plugs and four 1½-inch P.D.Q. Plugs, price $1.00.

For sale by Automobile Supply Houses, Garages and Dealers, or sent postpaid to any point in the world on receipt of $1.00. If not perfectly satisfactory the money will be refunded on return of unused plugs.

HUNTINGTON AUTOMOBILE CO., 666 Wall Street, Huntington, N.Y.

NATIONAL SALES CORPORATION, 296 Broadway, New York, Factory Sales Managers

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METAL POLISHES (Continued)

HATT Polish & Chemical Co., Chas. E., 388 Michigan Ave., Detroit, Mich.

HERCULES Chemical Works, Chicago, Ill. "Non-Such."

HINDS & Coon, 126 Pearl St., Boston, Mass.

HOFFMAN Co., J. W., 436 Atlantic Ave., Boston, Mass. "Anchor."

HOFFMAN, Geo. W., 551 E. Washington St., Indianapolis, Ind. "U. S."

LEADER Mfg. Co., 1808 Chestnut St., St. Louis, Mo.

LEAVITT, Gilbert, 11 India St., Boston, Mass.

LORD Polish Co., F. T., Cambridge, Mass.

LUSTRE Chemical Co., 1303 Michigan Ave., Chicago, Ill.

MARVEL—See Rex Chemical Co.

MEXICAN Mfg. Co., 239 S. Main St., Wichita, Kan. "Venus."

MINUTE—See Moore Co.

MODOC Co., foot of Market St., Chester, Pa.

MONARCH Mfg. Co., Toledo, O. "Sunlight."

MOORE Co., Geo. P., 721 Golden Gate Ave., San Francisco, Cal. "Minute."

NEWBERN Co., S. C., 430 Walnut St., Philadelphia, Pa.

NON-SUCH—See Hercules Chemical Works.

NOXAL Polish Mfg. Co., 1238 Belmont Ave., Philadelphia, Pa.

PAUL & Co., J. C., 59 Dearborn St., Chicago, Ill. "Auto-Shine."

PRESTOSHINE—See Sheppard, W. S.

PUTZ—See American Metal Polish Co.

RAIMES & Co., 50 Ferry St., N. Y. City. "Globe." (See page 171.)

RATH Mfg. Co., Hancock, Laurel & Second Sts., Philadelphia, Pa.

RED CROSS—See American Metal Polish Co.

REX Chemical Co., 842 W. Baltimore St., Baltimore, Md. "Crown." "Vels-ma." "Marvel."

RICHMOND & Co., C. C., 40 Batterymarch St., Boston, Mass. "Star."

ROYAL Lubricating Oil Co., 116 Broad St., New York, N. Y.

SCOUREE—See Harris Oil Co.

SHEPPARD, W. S., 22 Lawrence St., Newark, N. J. "Prestoshine." (See page opposite.)

SILVA PUTZ—See American Metal Polish Co.

SOLARINE—See Allers & Co.

SPARROW—See American Oil & Disinfectant Co.

SPEARE'S Sons Co., Alden, 369 Atlantic Ave., Boston, Mass.

STAR—See Bell Mfg. Co.

STAR—See Richmond & Co.

SUNLIGHT—See Monarch Mfg. Co.

U. S.—See Hoffman, Geo. W.

ULRICH & Co., Buffalo, N. Y. "A-O-K."

VELS-MA—

VENUS—See

YOUNG, Or sen Ave., (See page

BRUNT Por St., E. Liv

DIAMOND F (See page

GARY Co., York, N. Y.

HARTFORD

IMPERIAL I

ISOLIT—See

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STANDARD

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COTT

KRAEUTER N. J.

NOONAN To Rome, N. Y.

CRANK

CRANE Pull Mass.

JIFFY—See P

POLSON, W. N. Y. "Jiff

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Users know it
Others can

Invader Oil is made in three grades

Light
Medium
Heavy

Manufactured only by

Chas. F. Kellom & Co.
130 Arch St, Philadelphia

"DIAMOND" PORCELAINS

HIGHEST GRADE VITRIFIED PORCELAINS for SPARK PLUGS

AND ELECTRICAL PURPOSES

New and Difficult Designs a Specialty

The best porcelains cost no more than the inferior sort. "Diamond" Brand is the BEST Quality made. Accuracy our strong point. Lowest prices and prompt shipments.

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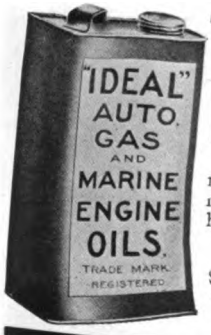
Write for full particulars and prices.

DIAMOND PORCELAIN CO.
Chauncey St., TRENTON, N. J.

SPRINGS

We want to figure with you on soft edge cushion springs and strips. The flat steel base, single cone construction is meeting with great success by us, but if you want the all wire, double cone construction, we will be glad to give you our best quotations.

DETROIT WIRE SPRING COMPANY, Detroit, Mich.



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Maintains a film of oil on pistons and cy inder walls under maximum heat and pressure. Does not foul ignition or valves. Motors retain normal compression and maximum power. Dealers should handle "**Ideal**" Oil.

Over 20 years experience with internal combustion engine.

PRESTOSHINE METAL POLISH. O. K. AUTO POLISH. SEMI-FLUID GREASE.

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AUTO Pump Co., Springville, N. Y. "Spencer."

B. B.—See Herz & Co.

HERZ & Co., 203 Lafayette St., New York, N. Y. "B. B."

PACIFIC Tucking & Mfg. Co., 471-473 18th St., Brooklyn, N. Y. "P. T. C."

P. T. C.—See Pacific Tucking & Mfg. Co.

ROTARY Triplex Pump Co., 126-128 South Jefferson St., Chicago, Ill.

SPENCER—See Auto Pump Co.

TILEY-Pratt Co., Essex, Conn.

HAND TIRE PUMPS

ARTIZAN Brass Co., 204 Lincoln Park Blvd., Chicago, Ill. "Savety."

BRIDGEPORT Brass Co., Bridgeport, Conn.

CLEVELAND Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.

CODMAN & Shurtleff, 120 Boylston St., Boston, Mass.

COLONIAL Brass Co., 316-318 Seneca St., Cleveland, O.

EUREKA—See Judd & Leland Mfg. Co.

FERODOWILL Mfg. Co., St. Paul, Minn.

GLEASON-Peters Air Pump Co., 181 Mercer St., New York, N. Y.

IMPERIAL Brass Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill. "Wixon." (See page 57.)

JUDD & Leland Mfg Co., Clifton Springs, N. Y. "Eureka."

KELLOGG, JR.—See Wray Pump & Register Co.

LEATHER & Brass Mfg. Co., Auburn, N. Y.

MANHATTAN Screw & Stamping Works, 67th St. & West End Ave., New York, N. Y.

MILLER Mfg. Co., Peekskill, N. Y.

NOERA Mfg. Co., Griggs St., Waterbury, Conn. "Perfect." "Red Devil." "Wonder."

PERFECT—See Noera Mfg. Co.

RED DEVIL—See Noera Mfg. Co.

SAVETY—See Artizan Brass Co.

SHAWVER Co., Springfield, O. "Springfield."

SKINNER & Skinner, 1337 Michigan Ave., Chicago, Ill.

SPRINGFIELD—See Shawver Co.

TURNER Brass Works, Sycamore, Ill. (See page 205.)

WIXON—See Imperial Brass Mfg. Co.

WONDER—See Noera Mfg. Co.

WRAY Pump & Register Co., 191-93 Mill St., Rochester, N. Y. "Kellogg, Jr."

OIL PUMPS

(See Lubricators)

S

AMERICAN Mich.

UNION Ste

STEAM

AMERICAN Mich.

OFELDT & New York

UNION Ste

WATER

AUTO & P cade, Cle (See page

BRENNAN

BROWN &

BYRNE, Kir

ESSEX Bra Detroit, M

FRIES & Co

GALVIN C Detroit, M

GARVIN Ma N. Y. City.

IMPERIAL ferson St. (See page

LIPMAN Mf Wis.

LOBEE Pum race, Buffa

McCORD & Chicago, I (See page

MILWAUKE Milwaukee,

NATIONAL

NEW YORK Ave., Brool

OBERDORFI Water St.,

PURITAN M Detroit, Mi

ROSS, H. S., Ill.

SANDERS, C lyn, N. Y.

SPENCE Mfg Wis.

SYMPHONY Detroit, Mic

VERSTRAET ton St., Milv

WESTERFIE Big Four I (See page I

POWER P

BROWN Beer St., Boston.

CHICAGO Pn Bldg., Chica

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BREECH-BLOCK PLUG

DEALERS

IT is much easier to sell a plug which possesses distinctive advantages that add to its value and efficiency. No plugs possess so many exclusive features as the "Breech-Block" plug. Pleasing your customers and making big business is certain.

Cleveland, Ohio,
April 2, 1907.

Gentlemen:—I have been using your spark plug for past six months in my sixty horse-power touring car. The engine, which is an exact duplicate of my engine in Green Dragon, is a very hot engine; therefore it is necessary for me to use plenty of oil. Therefore I find your spark plug the finest I ever used, being a hard matter to foul and so easy to clean once you do foul.

Yours truly,
BARNEY OLDFIELD

ADVANTAGES

One-sixth turn of the handle opens.
Entire porcelain is exposed for cleaning.
One twist makes instantly white.
Locks with the push of a finger.
Tight to 2,000 pounds.
No wrench to get, use or replace.
Terminal clips with each plug.
No thumb-nuts to loosen. No pliers.
Stuffing nut chambered.
Plugs held by their handle in testing.
Not balanced on edge of your engine.
Soot-proof to the limit.
Unaffected by oil.
Chambered end protects porcelain.
Keeps porcelain fragments from cylinder.
Slightest piston movement cleans points.
Makes starting easy; fires first charge.
Big cars run slow on high gear.
Closely throttled; not a skip.

Every possible requirement completely satisfied. Better value than any other plug made. Write for booklet of this famous spark plug that can be cleaned in less than 4 seconds.

Made by **THE STANDARD CO., Torrington, C**

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CROWELL, Gilmer, 292-296 Graham St., Brooklyn, N. Y.

FERODOWILL Mfg. Co., St. Paul, Minn.

FULMER, C. F., Plainfield, N. J.

JACOBSON Machine Mfg. Co., Warren, Pa.

MARTIN & Anson Co., 2226 Indiana Ave., Chicago, Ill.

NATIONAL Brake & Electric Co., Milwaukee, Wis.

NEW Era Gas Engine Co., 9 Dale Ave., Dayton, O.

SPACKE Machine Co., F. W., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.
(See page 183.)

VICTOR Electric Co., 55-61 Market St., Chicago, Ill.

WESTINGHOUSE Air Brake Co., Pittsburg, Pa.

PUSHES

FOOT PUSHES

(For ringing electric bells)

EDWARDS & Co., 140th & Exterior Sts., New York, N. Y.

PUTTY

ACME White Lead & Color Works, Detroit, Mich.

ALLENTOWN Mfg. Co., 26 S. Sixth St., Allentown, Pa.

AMERICAN Whiting & Putty Mfg. Co., 200 Water St., New York, N. Y.

BELKNAP, McSherry & Moran Co., E. S., 5 Ainslie St., Brooklyn, N. Y.

BRIGGS & Co., John, 14 Washington St., Boston, Mass.

CHICAGO White Lead & Oil Co., Chicago, Ill.

DEVOE & C. T. Raynolds Co., F. W., 103 Fulton St., New York, N. Y.

DICKS & Wiggim Co., 28 N. Canal St., Dayton, O.

FELTON, Sibley & Co., 136-40 N. Fourth St., Philadelphia, Pa.

FRENCH & Co., Samuel H., Fourth & Callowhill Sts., Philadelphia, Pa.

FULLER & Co., Hallowell, Me.

HOFFMAN Co., J. W., 436 Atlantic Ave., Boston, Mass.

LUCAS & Co., John, 322 Race St., Philadelphia, Pa.

PHILLIPS Mfg. Co., John B., 80 Ninth St., Brooklyn, N. Y.

PIQUA Paint & Putty Co., Piqua, O.

WILHELM Co., A., Reading, Pa.

BRIDGEP
Ave., Br

HORSTM
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SCHLEGE
ter, N.

VOGHT M
Paul St.,

CONNECT
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CRADLE—

DUANE &
York, N.

FULLER C

HART Mfg
Mass.

MASON, Jo
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MOTOR Co
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NOONAN
Dow St.,

P & S—See

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SMITH, Ch
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Paterson,

STANDARD
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WATER C

A-Z Co., 52
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BRISCOE
Newark,
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DETROIT A
wood Ave
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FEDDERS M

HAYES Mfg
Detroit, M
(See page

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A-Z

Radiators of various principles and designs come and go, but the radiator that always stays, always leads, always improves, always outwears, and always outsells all others is the

A=Z Square Bulge, Seamless Tube RADIATOR

Why not equip your cars with **a radiator of quality**—the A-Z, and bring satisfaction to your customer and profit and reputation to yourselves. In conjunction with the manufacture of radiators, we make **Metal Bodies, Hoods, Metal Tool Boxes and Body Parts, Mud Guards, Fenders and Wings, Seamless Tubing and do**

REPAIR WORK

of all descriptions. Owners and manufacturers will find our shop skillful in its work, prompt in deliveries and moderate in price.

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AUTOMOBILE PARTS THE A-Z CO. NEW YORK

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WATER COOLERS OR RADIATORS
(Continued)

HEWITT Motor Co., 6 E. 31st St., New York, N. Y. "Livingston."

KELLS Mfg. Co., W. J., 60-62 Van Winkle Ave., Jersey City, N. J.

KINSEY Mfg. Co., 1126 E. 3rd St., Dayton, O. "Kinwood."

KINWOOD—See Kinsey Mfg. Co.

LIVINGSTON—See Hewitt Motor Co.

LONG Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.

LONG-Turney Mfg. Co., Rome, N. Y.

McCORD & Co., 1400 Old Colony Bldg., Chicago, Ill.
(See page 127.)

MAYO Radiator Co., New Haven, Conn.
(See page opposite.)

METAL Stamping Co., 243 West St., N. Y. City.

NOYE Mfg. Co., 50 Lakeview Ave., Buffalo, N. Y.

OHIO Blower Co., 330 Prospect Ave., N. W., Cleveland, O.

STANDARD Metalwork Co., Thompsonville, Conn.

WOLVERINE Radiator Co., Detroit, Mich.

WHITLOCK Coil Pipe Co., Hartford, Conn.
(See page opposite.)

WRIGHT Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill.

SMITH
St., De
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TURNER
(See p

ALTER

COOPER
N. Y.

GENERA

MIRR

BAUSCH
N. Y.

MACBETH

MATISSE
N. Y. Cit

SCHEIDIG
N. Y. Cit

RAILS

ROBE OR COAT RAILS

AMERICAN Motor Parts Co., Chicago, Ill.

APPLIANCE Mfg. Co., 72-86 W. Jackson Blvd., Chicago, Ill.

AUTO Accessories Mfg. Co., Detroit, Mich. "Sterling."
(See page 219.)

AUTO Rail & Equipment Co., 113 Michigan Trust Bldg., Grand Rapids, Mich.

CURRY & Abeles, 229 Mulberry St., Newark, N. J.
(See page 109.)

DOUGLAS & Lomason Co., 302 Grand River Ave., Detroit, Mich.

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

IMPERIAL Brass Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill.
(See page 57.)

MASON, John A., 312 Washington St., Newton, Mass.

MURDOCK Co., Jas., Jr., 116 Opera Place, Cincinnati, O.

NEW YORK Coach & Auto Lamp Co., 794-98 10th Ave., N. Y. City.

POLSON, W. F., 27 Chenango St., Buffalo, N. Y.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

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FUEL

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WALKER
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LOCKE Regu

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LANE Motor
N. Y.

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WALKER C
Louisville, K

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Phineas Jones & Co.

Newark, New Jersey

Make the best Automobile wheels. Only one quality—the **best.** Fifty years at vehicle wheel making.

WE manufacture the best radiators made in this country at the present time. They are high grade in every respect.

We make Honeycomb, Cellular and Flat Tube Radiators of several designs, all fully covered by patents.

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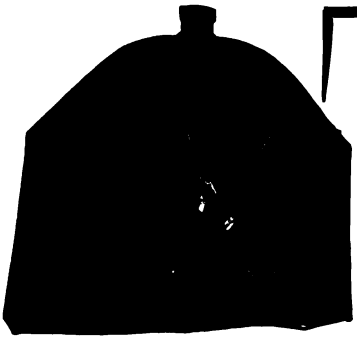

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20,000 IN DAILY USE

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HARTFORD, CONN.

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Flat Tube Radiator, Collapsible Hood and Hollow Metal Dash

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Makers of the

"DETROIT"

Hoods, Radiators, Tanks, Hollow Metal Dashes and other Metal Specialties

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DETROIT, MICH.

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REPAIRERS

SPRING REPAIRERS

(See Clamps, Spring Repair)

RESTS

BOW RESTS

CURRY & Abeles, 229 Mulberry St., Newark, N. J. (See page 109.)

GLOBE Brass Works, 15-17 Macomb St., Detroit, Mich.

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

SMITH & Co., Jos. N., 154-62 Fourth St., Detroit, Mich. (See page 223.)

FOOT RESTS

(See also Hassocks)

AMERICAN Motor Parts Co., Chicago, Ill.

APPLIANCE Mfg. Co., 72-86 W. Jackson Blvd., Chicago, Ill.

AUTO Accessories Mfg. Co., Detroit, Mich. "Sterling." (See page 219.)

AUTO Rail & Equipment Co., 113 Michigan Trust Bldg., Grand Rapids, Mich.

BURROWS Co., E. T., Portland, Me.

CURRY & Abeles, 229 Mulberry St., Newark, N. J. (See page 109.)

DOUGLAS & Lomason Co., 302 Grand River Ave., Detroit, Mich.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (See page 49.)

HILLMAN Plating & Auto Supply Co., 446 Tremont St., Boston, Mass.

IMPERIAL Brass Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill. (See page 57.)

NEW York Coach & Auto Lamp Co., 794-98 10th Ave., N. Y. City.

POLSON, W. F., 27 Chenango St., Buffalo, N. Y.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. (See page 223.)

STERLING—See Auto Accessories Mfg. Co.

TURNER Brass Works, Sycamore, Ill. (See page 205.)

RETAINERS

BALL RETAINERS

BOSTON Pressed Metal Co., 171-73 Union St., Worcester, Mass.

CROSBY Co., Buffalo, N. Y. (See page 83.)

GLOBE
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(See 1

KONIG
O.
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WORCE
Mass.

BATTI

CUTLEI
Wis.

GENER

LEONA
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WESTI
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WIRT I
Philad

CRESCE
York.

HARTF
St., N.
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REPUBI

AMERIC
port, C

JAMESV

MIDGLI
Hockir

PEUGE
N. Y.

STAND

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Aves.

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N. J.
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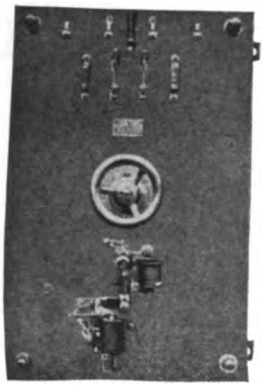

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The only Rheostat in the world with a 10 to 1 range of control of the charging current.

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"WARD LEONARD STANDARD" FOR ELECTRIC AUTOMOBILES

Any number of cells from 1 to 44 (and *any* ignition storage battery) can be charged at *any* desired rate, from 4 to 40 amperes on a 125 volt circuit, by using our MP140 Rheostat. Thousands in service. Immediate shipment from stock.

PRICE, $40.00 LIST

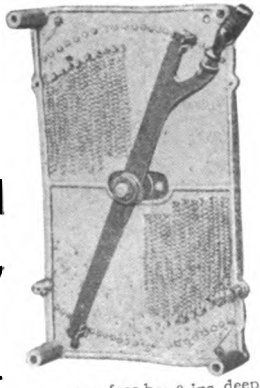
A Private Plant Installation

Complete with protective circuit breakers, rheostat, switch and fuses.

PRICE, $60.00 LIST

Stock article. Order today; simply state the maximum charging rate and the supply voltage

Start the charge at any desired rate, leave it and when the charge is completed the circuit will be automatically opened.



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Ward Leonard Electric Company

30 PONDFIELD ROAD,

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Bronxville, N. Y.

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AMERICAN Wood Rim Co., Onaway, Mich.

HAGERSTOWN Spoke & Bending Co., Walnut & Church Sts., Hagerstown, Md.

JONES & Co., Phineas, 301 Market St., Newark, N. J.
(See page 179.)

RASTETTER & Son, Louis, Ft. Wayne, Ind.

TUCKER Woodwork Co., Sidney, O.

RINGS

DUST RINGS

(See Washers, Felt)

PISTON RINGS

JORDEN, R. H., 110 Sheridan St., Allegheny, Pa.

KONIGSLOW Mfg. Co., Otto, Cleveland, O.
(See page 49.)

SPACKE Machine Co., F. W., Madison Ave. & Merrill St., Indianapolis, Ind.
(See page opposite.)

VESTRAETE Mfg. Co., Edmond, 421 Clinton St., Milwaukee, Wis.

RIVETS

BRASS AND COPPER RIVETS

BLAKE & Johnson, Waterbury, Conn.

BRIDGEPORT Brass Co., Bridgeport, Conn.

COBB & Drew, Plymouth, Mass.

HASSALL, John, Clay & Oakland Sts., Brooklyn, N. Y.

HUNGERFORD Brass & Copper Co., U. T., Pearl & Park Sts., New York, N. Y. "Star."

PLUME & Atwood Mfg. Co., Waterbury, Conn.

ROME Brass & Copper Co., Rome, N. Y.

RUSSELL & Erwin Mfg. Co., New Britain, Conn.

STAR—See Hungerford Brass & Copper Co.

TAUNTON Rivet Co., Taunton, Mass.

WATERBURY Brass Goods Corp., Waterbury, Conn.

COPPER RIVETS

(See Rivets, Brass)

AMERICAN
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ATLAS Bol
Road, N.
CHAMPION
land, O.
COBB & D
COLUMBUS
St., Colum
FALLS Ri
Falls, O.
GARLAND
Bldg., Pitt
GRAND Cr
Chicago, I
HASSALL,
Brooklyn,
HOOPER &
St., Philad
KANSAS C
Mo.
LAMSON &
Cleveland,
MICHIGAN
drum Ave
MOORE Co.
NATIONAL
NEWARK
Newark, N
OLIVER Ir
PITTSBUR
Ry., Pitts
REED & I
Worcester
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BISHOP &
BLIZZARD
CHASE Co.
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CROSBY
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DAVIS Rob
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York, N.

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Annealed Engine Pistons and Piston Rings, Connecting-rods, Mitre and Engine Gears

We are also prepared to furnish finished die-cast Nickel Babbitt or White Brass Crank Shaft or Connecting Rod Bushings

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PARSONS Buggy Top Co., 70 W. Jacks Blvd., Chicago, Ill.

PIONEER Woolen Mills, 1020-40 Beaufa St., Detroit, Mich.

RILEY & Son, Wm. B., 324-326 Market St. Philadelphia, Pa.

SCANDINAVIAN Fur & Leather Co., 16 W. 33rd St., N. Y. City.

SPEAR-Martin Fur Co., 41 Church St., Burlington, Vt.

STALL & Dean Mfg. Co., 23 Foundry St., Brockton, Mass.

VEHICLE Apron & Hood Co., 272 N. 4th St., Columbus, O. "Blizzard."

WALLACE Co., Hugh, Boulevard & Orleans St., Detroit, Mich.

RODS

ALUMINUM RODS

(See Aluminum Sheet)

BRASS RODS

(See Brass, Sheet)

CONNECTING RODS

(Finished or Machined Rods. For Connecting Rods in the rough—See Forgings, Drop.

AMERICAN & British Mfg. Co., Bridgeport, Conn.

ANDERSON Forge & Machine Co., 21-31 St. Aubin Ave., Detroit, Mich. (See page 79.)

FUNK Engineering Co., 39-45 14th St., Hoboken, N. J.

GILL & Sons Forge & Machine Works, P. H., Brooklyn, N. Y.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O. (See page 49.)

OBENBERGER Co., John, 220 Lake St., Milwaukee, Wis.

SPACKE Machine Co., F. W., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind. (See page 183.)

STANDARD Connecting Rod Co., Beaver Falls, Pa. (See page opposite.)

TINDEL-Morris Co., Eddystone, Pa.

COPPER RODS

(See Brass Sheet)

FIBRE RODS

(See Fibre, Hard)

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New York

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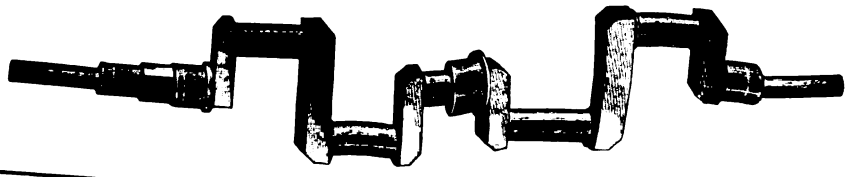

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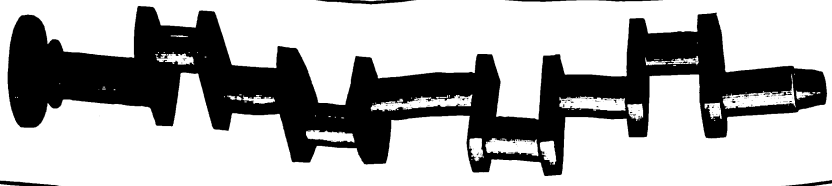
MADE FROM A SPECIAL GRADE OF

OPEN HEARTH STEEL STEAM HAMMERED FORGINGS

RE-HEATED AND OIL TEMPERED

Also NICKEL STEEL OR CHROME NICKEL STEEL

Any size up to four inches in diameter



All cylindrical parts finished true to sizes by grinding
No Stock Sizes

MADE TO ORDER ONLY FROM BLUE PRINTS OR DETAILED DRAWINGS FURNISHED

SEND COMPLETE SPECIFICATIONS FOR PRICES

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BEAVER FALLS, PA.

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(SeeFlux, Soldering)

SCREENS

HORN SCREENS

AUTOMOBILE Supply Mfg. Co., 139-47 Emerson Pl., Brooklyn, N. Y.

LOMBARDI Motor Co., 71 Minerva St., Derby, Conn.

MANHATTAN Screw & Stamping Works, 67th St. & West End Ave., New York, N.Y.

TRIPARI Bros. & V. De Prisco Co., 179 Mott St., New York, N. Y. (See page opposite.)

TYLER Co., W. S., 3618 St. Clair Ave., N. E., Cleveland, O.

SCREWS

MACHINE SCREWS

AMERICAN Screw Co., Providence, R. I.

ATLAS Bolt & Screw Co., 1289 Marquette Road, Cleveland, O.

CORBIN Screw Corporation, New Britain Conn.

CRITCHLEY Machine Screw Co., 25 Union St., Worcester, Mass.

DETROIT Screw Works, Detroit, Mich. (See page 263.)

FERRY Cap & Set Screw Co., 2151 Scranton Road, Cleveland, O.

HARTFORD Machine Screw Co., Hartford, Conn. (See page 261.)

HILL Co., Geo. Q., 326 A St., Boston, Mass.

HOLT & Co., W. H., 95 Pine St., Providence, R. I.

KIRK-Latty Mfg. Co., W. Madison Ave. & N. Y. C. Ry., Cleveland, O.

NATIONAL-Acme Mfg. Co., Cleveland, O.

NATIONAL Screw & Tack Co., Stanto Ave., S. E., & C. & P. Ry., Cleveland, O.

REED & Prince Mfg. Co., Duncan Ave Worcester, Mass.

RUSSELL & Erwin Mfg. Co., New Britai Conn.

WESTERN Automatic Machine Screw C Elyria, O.

WORCESTER Machine Screw Co., 79 Bea St., Worcester, Mass.

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SPECIAL SCREW MACHINE PAI TO ORDER

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BROWN Machine Co., Battle Creek, Mi

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have proved themselves winners and equal to all tests given them. If you want a coil that never breaks down in the windings and that has the highest possible speed, look into the merits of our goods.
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New
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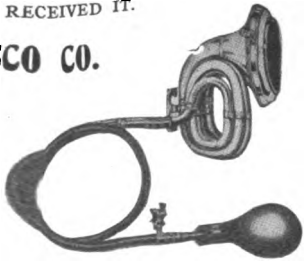
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SUPPLEMENTARY SEATS
(Continued)

DAYTON Folding Tonneau Co., 1141 N. Main St., Dayton, O.

EMPIRE Gear & Top Co., 207 N. 22nd St., Philadelphia, Pa.

FRANTZ Body Mfg. Co., Stanton Ave. & Getz St., Akron, O.

GRAVES & Congdon Co., Amesbury, Mass.

HILL Mfg. Co., 25-27 Fuller St., Buffalo, N. Y.

HUME Carriage Co., Amesbury, Mass. (See page 251.)

ITHACA Carriage Co., Ithaca, N. Y.

KIMBALL & Co., C. P., Chicago, Ill. (See page 87.)

RACINE Metal Chair Co., 406 Main St., Racine, Wis.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SEPARATORS

BOW SEPARATORS

AMESBURY Brass & Foundry Co., Amesbury, Mass. (See page 89.)

COWLES & Co., C., New Haven, Conn.

CURRY & Abeles, 229 Mulberry St., Newark, N. J. (See page 109.)

EVANS Mfg. Co., 118 West Brookline St., Boston, Mass.

GLEASON—See India Rubber Tire Co.

INDIA Rubber Tire Co., 477 Wabash Ave., Chicago, Ill. "Gleason." (See page 189.)

MICHIGAN Top Co., 15-17 Duffield St., Detroit, Mich.

MURPHY Co., G. W. J., Merrimac, Mass.

NEVER-RUB—See Springfield Auto Top & Upholstering Co.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SMITH & Co., Jos. N., 154-162 Fourth St., Detroit, Mich. (See page 223.)

SPRINGFIELD Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass. "Never-Rub." (See page 279.)

SHAFTING

FLEXIBLE SHAFTING

COATES Clipper Mfg. Co., Worcester, Mass. (See page 133.)

GEM Mfg. Co., Spruce near 33d St., Pittsburg, Pa.

HELIX Mfg. Co., Stapleton, N. Y.

STOW Flexible Shaft Co., Philadelphia, Pa.

WHITE Dental Mfg. Co., S. S., 12th & Chestnut Sts., Philadelphia, Pa.

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The Gleason Cushioned Bow Rest and Protector

PATENT APPLIED FOR

THIS is the very latest device for Automobiles. Positively prevents all wearing and scarring of the bows. Holds them securely from jarring or shaking. Prevents rattling. Stops all friction and rubbing of the top, thus saving wear and tear and giving long life. One of the most ingenious devices for automobiles that has ever been invented.

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BROC Carriage & Wagon Co., E. 40th St. & Payne Ave., Cleveland, O.

BUFFALO Auto Body & Trimming Co., 338 Ellicott St., Buffalo, N. Y.

BUOB & Scheu, 408-10 E. Court St., Cincinnati, O.

CARTIER, Chapman & Co., Ludington, Mich.

CHICAGO Coach & Carriage Co., 1223-31 Michigan Ave., Chicago, Ill.

CHICAGO Wind Shield Co., 235 Johnson St., Chicago, Ill.

COLEMAN, J. C., 58-60 First St., Detroit, Mich.

CONOVER Motor Car Co., Paterson, N. J.

DUANE & Co., W. J., 1771 Broadway, N. Y. City.

EMPIRE Gear & Top Co., 207 N. 22d St., Philadelphia, Pa.

FAVORITE—See Smith & Co., Jos. N.

FELLWOCK Automobile & Mfg. Co., 320 Upper 4th St., Evansville, Ind.

FICKLING & Co., 154 E. 57th St., New York, N. Y.

FINDEISEN & Kropf Mfg. Co., 21st & Rockwell Sts., Chicago, Ill.

HILL Mfg. Co., 25-27 Fuller St., Buffalo, N. Y.

LASCO—See London Auto Supply Co.

LIMOUSINE & Carriage Mfg. Co., 3515 Michigan Ave., Chicago, Ill. "Beecher." "Schildback." "Voltz."

LONDON Auto Supply Co., 1229 Michigan Ave., Chicago, Ill. "Lasco."
(See page 221.)

MANHATTAN Auto Top Co., 249 W. 64th St., N. Y. City.

MECKEL, Fred L., 77-83 E. 13th St., Chicago, Ill.

MEYER, Morris F., 65-69 E. Woodbridge St., Detroit, Mich.
(See page 191.)

MICHIGAN Top Co., 15-17 Duffield St., Detroit, Mich.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

RITTER Mfg. Co., 63 Amsterdam Ave., Detroit, Mich.

ROSS, H. S., 5607 S. Halsted St., Chicago, Ill.

SCHILDBACK—See Limousine & Carriage Mfg. Co.

SMITH & Co., Jos. N., 154-162 4th St., Detroit, Mich. "Favorite."
(See page 223.)

SPRAGUE Umbrella Co., Norwalk, O.

STERLING—See Auto Accessories Mfg. Co.

STUDEBAKER Bros. Mfg. Co., 378 Wabash Ave., Chicago, Ill.

TEEL Mfg. Co., 132 Main St., Medford, Mass.

THOMPSON Co., E. J., 5917-19 Penn Ave., Pittsburg, Pa.

TROY Carriage Sunshade Co., Troy, O.

VOLTZ—See Limousine & Carriage Mfg. Co.

WOOD & Son, Frederick R., 217 W. 19th St., New York, N. Y.

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ACME S
York.

**BALDW
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COMSTC
New Y

DIEZEM
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EDO—Se

FOSTER

GABRIE
N. E.,

GRAHAI
York,

GRAYGC

**HARTF
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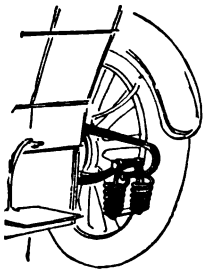

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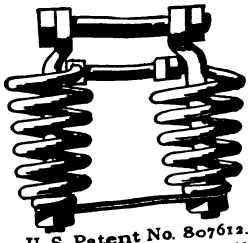

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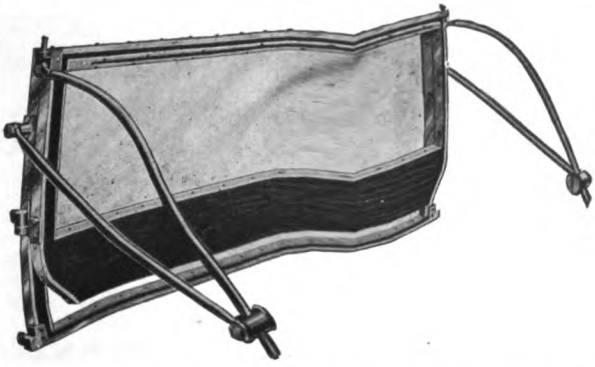

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AKRON Pneumatic Tire & Protector Co., Akron, O.

GRINARD Inserted Leather Auto Shoe Co., Buffalo, N. Y. (See page 145.)

INNER Shoe Tire Co., 64 Monroe St., Grand Rapids, Mich.

MANNING Mfg. Co., Holyoke, Mass.

SIGHT-FEEDS

INDEPENDENT SIGHT FEEDS

GREENE, Tweed & Co., New York, N. Y.

LUNKENHEIMER Co., Cincinnati, O.

McCORD & Co., Chicago, Ill. (See page 127.)

NUGENT & Co., Wm. W., 18-30 W. Randolph St., Chicago, Ill.

PEDERSEN Mfg. Co., New York, N. Y. (See page 129.)

SHERWOOD Mfg. Co., Elmwood Ave. & Belt Line, Buffalo, N. Y.

SILK

UPHOLSTERY SILK

CHENEY Bros., S. Manchester, Conn.

FULTON & Co., G. W., Paterson, N. J.

ROBERTSON, W. J., Paterson, N. J.

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TIRE REPAIR SLEEVES OR BANDS

(For lacing or strapping around a tire to cover a puncture or blowout)

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AKRON Pneumatic Tire & Protector Co. Akron, O.

CHICAGO Rawhide Mfg. Co., 75-77 Ohio St., Chicago, Ill.

EMPIRE Automobile Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

GILBERT Mfg. Co., New Haven, Conn. (See page 267.)

GORDON—See Vehicle Apron & Hood Co.

GRATON & Knight Mfg. Co., 94-104 Bloomingdale Road, Worcester, Mass.

HEALY Leather Tire Co., 90 Gold St., N. Y. City. (See page 35.)

INNEI Rapi

KIMB/

MESIN First

TRAV Bros (See

VEHIC St., (

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is a vegetable oil product. Contains no alkali or gritty substance to mar and scratch polished surfaces. Its business is with the dirt alone.

Mobo quickly removes the dirt, and prevents peeling and cracking of paint and varnish. Also brings out the "tone" of the paint and adds lustre to the auto body.

Used by all leading garages.

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HAND SOAPS AND PASTES
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GREEN Oil Soap Co., 92 Market St., Chicago, Ill.

HYDRO-Palm Soap Co., 22 Minott St., Neponsett, Mass.

JERGENS Co., Andrew, Cincinnati, O.

KIRK & Co., James S., Chicago, Ill.

RICHMOND & Co., C. C., 40 Batterymarch St., Boston, Mass. "Star."

ROME Soap Mfg. Co., Rome, N. Y.

SHOFO—See Stanley, John T.

SKAT Mfg. Co., 791 Park St., Hartford, Conn.

SKIDOO—See Brown Soap Co.

STANLEY, John T., 626 West 30th St., New York, N. Y. "Shofo."
(See page 193.)

STAR—See Richmond & Co.

UNEEDIT—See Cross, W. H.

UTILITY Co., 332 Broadway, New York, N. Y. "Gre-Solvent."

WALTKE & Co., Wm., Grand & Second Sts., Lakeside Ave., Cleveland, O.

WHITE & Bagley Co., 100 Foster St., Worcester, Mass. "Cleanzum."

SOCKETS

BOW SOCKETS

AJAX—See Cortland Forging Co.

ASHTABULA Bow Socket Co., 99-101 Prospect St., Ashtabula, O.

BEECHER—See Limousine & Carriage Mfg. Co.

CLEVELAND Hardware Co., 45th St. & Lakeside Ave., Cleveland, O.

CORTLAND Carriage Goods Co., Cortland, N. Y.

CORTLAND Forging Co., Cortland, N. Y. "Ajax."
(See page 89.)

CRANDALL, Stone & Co., Binghamton, N. Y.

LIMOUSINE & Carriage Mfg. Co., 3515 Michigan Ave., Chicago, Ill. "Beecher."

METAL Stamping Co., 243 West St., New York, N. Y.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

SOLDER

ALUMINUM SOLDER

ALUMINUM Solder & Refining Co., Oswego, N. Y. "Alumunite."

ALUMUNITE—See Aluminum Solder & Refining Co.

ARROW—See Lester Co.

CLUM & Atkinson, 575 Lyell Ave., Rochester, N. Y.

JANNEY, Steinmetz & Co., 4th & Market Sts., Philadelphia, Pa.
(See page 277.)

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THE

SPRINGFIELD MOTOMETER

"The Speedometer That Has Made Good."

The speedometer that is *approved* and *used* by the car owners is the speedometer for the trade.

The Springfield Motometer has the confidence of the car buyer. It has consistently *proved* all that it claims.

It has *reputation*, based on two years of *sale* and *use*,—not on expectations.

Every time you put a Springfield on a customer's car you have done a good turn to him and yourself.

Every one you sell makes a satisfied customer.

The Motometer goes on doing what it is made to do and doing it *right*.

If you don't *know all about it*, write us for catalogue and terms.

The *instrument* is right. The *price* is right. The *margin* is right.

Ask for Catalog C. S.

THE R. H. SMITH MFG. COMPANY

SPRINGFIELD, MASS.

Established 1865 Incorporated 1883

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SPEEDOMETERS (Continued)

MILLER Speedometer Co., 97 Reade St., N. Y. City.

MONITOR Speed Recorder Co., 274 Pearl St., Cambridge, Mass.

MOTOMETER—See Smith Mfg. Co.

NIAGARA Tachometer & Instrument Co., 26th & Adams Sts., Niagara Falls, N. Y.

ODO—See Rubay, Leon.

RUBAY, Leon, 1697 Broadway, New York, N. Y. (Importer). "Odo."

SMITH Mfg. Co., R. H., Springfield, Mass. "Motometer." (See page 195.)

SPEEDOGRAPH Co., Philadelphia, Pa.

STEWART & Clark Mfg. Co., 514 Diversey Blvd., Chicago, Ill. "American." (See page 135.)

VEEDER Mfg. Co., 22 Sargeant St., Hartford, Conn.

VELOCIMETER—See Connecticut Gauge Co.

WARNER Instrument Co., 723 Roosevelt St., Beloit, Wis. "Auto-Meter." (See page 277.)

WEBB Mfg. Co., 60 Shipman St., Newark, N. J.

WINCHESTER Speedodometer Co., Motor Mart, 62d St. & Broadway, New York, N. Y.

SPOKES

WIRE SPOKES

STANDARD Co., Torrington, Conn.

WIRE Goods Co., 16-28 Union St., Worcester, Mass.

SPRAGS

DROP SPRAGS

(See Brakes, Drop)

SPRINGS

LEAF SPRINGS

ARMSTRONG Mfg. Co., J. B., Flint, Mich.

CLEVELAND-Canton Spring Co., Canton, O.

DELANEY & Son, D., Liberty & Hamilton Sts., Newark, N. J.

DETROIT Steel Products Co., 141 St. Antoine St., Detroit, Mich.

FOREST City Spring Works, Maine Ave. & Center St., Cleveland, O.

FORT Pitt Spring & Mfg. Co., Farmers' Bank Bldg., Pittsburg, Pa.

GARDEN City Spring Works, 2000 Purple St., Chicago, Ill.

HARVEY Spring Co., Racine, Wis.

HESS-Pontiac Spring & Axle Co., Pontiac, Mich.

KALAM zoo, M
KEYST wood
LEWIS
MERRI St., N
NEW Y New
PENN
PERFE Ave.,
ROWL adelp
SHELD
SHULE N. Y.
SPRIN port,
THOM
TRIPL gan (See
TROY Troy,
TUTHI Chica (See

AMER burg,
AMER Chica
BARN (See
CARY City.
CHAT
CLEV Ave.
DUNB
EURE City.
FORT Bank
GIBSO bury (See
HEBB N. J.
HUBB Mich (See
INDE Bldg
MANE
MILL Broo
MORG
NEW N. J
RAIL
RAYM Pa.
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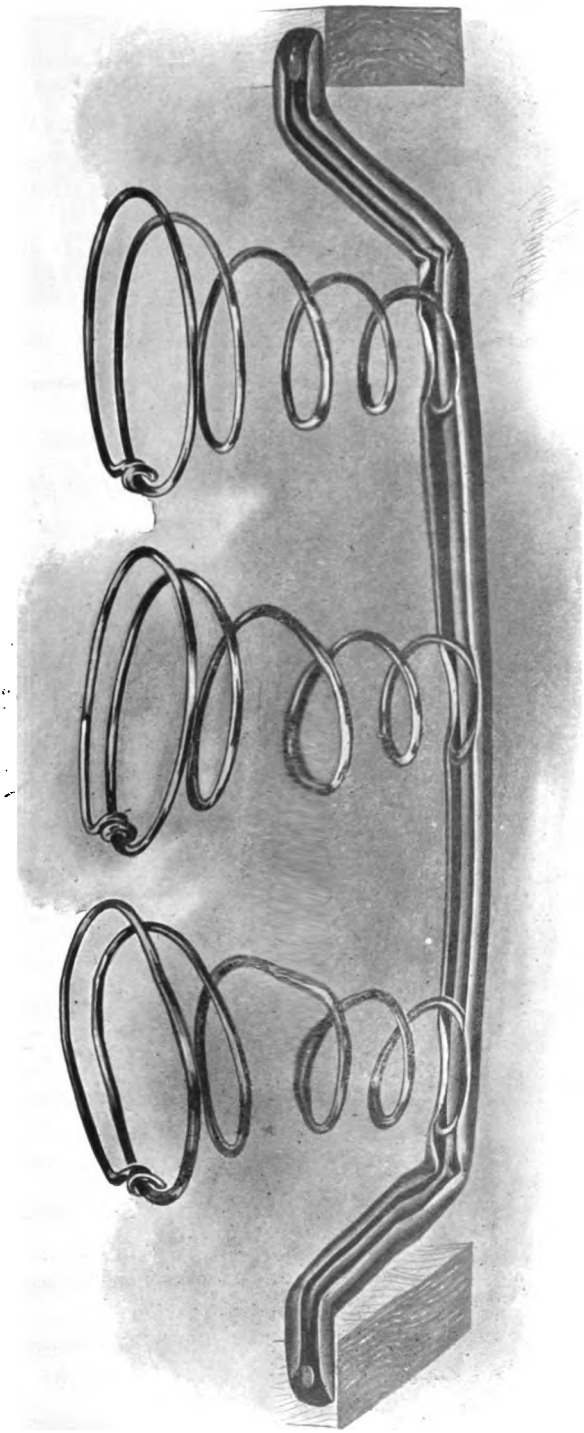

THE ABOVE ILLUSTRATION TELLS THE STORY.

The principle is an ideal one, a maximum of strength and a minimum of material.

The spiral and the bar—united make possible perfect spring construction.

The Cardinal is shipped to you finished and ready for the frame. Not more than thirty seconds required to spring the seat.

Note:—No perforation to weaken the bar.

A POSTAL WILL BRING YOU A SAMPLE.

BARBER MANUFACTURING COMPANY,

ANDERSON, INDIANA, U. S. A.

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SEAT OR UPHOLSTERY SPRINGS

BARBER Mfg. Co., Anderson, Ind.
(See page 197.)

BARNES Co., Wallace, Bristol, Conn.
(See page 201.)

CLEVELAND Wire Spring Co., Hamilton Ave. & E. 38th St., Cleveland, O.

D'ARCY Spring Co., Kalamazoo, Mich.
(See page 201.)

DETROIT Wire Spring Co., Detroit, Mich.
(See page 173.)

GIBSON Co., Wm. D., Huron & Kingsbury Sts., Chicago, Ill.
(See page 201.)

HEBB, Geo. A., 70 William St., Newark, N. J.

HUBBARD Spring Co., M.D., Pontiac, Mich.
(See page 201.)

INDEPENDENT Steel & Wire Co., House Bldg., Pittsburg, Pa.

KELLEY & Co., E., 509 Main St., Worcester, Mass. "Union."

METAL Stamping Co., 243 West St., New York, N. Y.

MORGAN Spring Co., Worcester, Mass.

NATIONAL Spring & Wire Co., Albion, Mich.

NEW YORK Wire & Spring Co., 71 Park Ave., Hoboken, N. J.

ROUGH RIDER—See Ventilated Cushion & Spring Co.

UNION—See Kelley & Co.

VENTILATED Cushion & Spring Co., Jackson, Mich. "Rough Rider."

WING Co., Charles, Amesbury, Mass.

SUPPLEMENTARY SPRINGS

(See Shock Absorbers)

SPROCKETS

MACHINED SPROCKETS

(For Sprocket Blanks—See Castings; also Forgings)

BALDWIN Chain & Mfg. Co., 194 Chandler St., Worcester, Mass.
(See page 139.)

BOSTON Gear Works, Norfolk Downs, Mass.

BULTMAN Co., F. H., 2108 Superior Viaduct, Cleveland, O.

COLLMER Bros., 105 Vistula Ave., South Bend, Ind.

CULLMAN Wheel Co., 1030 Dunning St., Chicago, Ill.
(See page 53.)

DIAMOND Chain & Mfg. Co., 231 West Georgia st., Indianapolis, Ind.
(See page 65.)

FORG, Peter, 50 Park St., Somerville, Mass.

GRANT Gear Works, 6 Portland St., Boston, Mass.

MUNCIE Gear Works, 801 E. Charles St., Muncie, Ind.

PARISH & Bingham Co., 5363 Hamilton Ave., Cleveland, O.
(See page 93.)

SIER-Ba York, N (See pa

SPACKE Ave., M lis, Ind (See pa

THROOP falo, N.

WOBURN St., Wa

AMERIC port, Co

AVERY Ave., C (See pa

BAY Stat Worcest

BOSTON St., Wo

BOWEN N. Y.

CROSBY (See pa

FORG, Pe

GLOBE N lilton A (See pa

HALL Co falo, N. (See pa

HILL Co.,

HYDRAU 61st St (See co

INDESTR Michig (See pa

JANNEY, Market (See pa

KEIM Mil

KONIGSL O. (See pa

MANHAT 67th St.

METAL S dolph St

MOSSBER

NORTMA Layton

PARISH Ave., C (See pa

PARISH Reading

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SMITH C wauke (See pa

SNOW, I N. Y.

TURNER (See pa

WORCES Mass.

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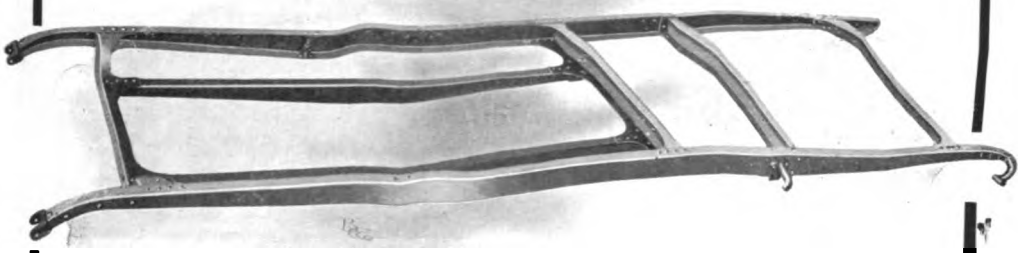

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High Carbon, Nickel, or Chrome Nickel

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HANSON, C. H., 44 S. Clark St., Chicago, Ill.

MONOGRAM Crest & Sign Co., 1937 Broadway, N. Y. City.

MURDOCK, Jr., Co., Jas., 116' Opera Pl., Cincinnati, O.

NESS, Jr., Geo. M., 61 Fulton St., New York, N. Y.

NEW YORK Stencil Works, 100 Nassau St., N. Y. City.

QUINT & Sons, S. H., 15 S. 4th St., Philadelphia, Pa.

ROBBINS Mfg. Co., John, 58 Kneeland St., Boston, Mass.

SACKMAN, W. L., 19 Cherry St., Akron, O.

SMITH Mfg. Co., R. H., Springfield, Mass.
(See page 195.)

STARTERS

AUTOMATIC GAS ENGINE STARTERS

AUTO Improvement Co., 316 Hudson St., New York, N. Y. "Ever Ready."

BALL, F. H. & F. O., Plainfield, N. J.

EVER READY—See Auto Improvement Co.

KANE Starting Device Co., 762 Junction Ave., Detroit, Mich.

MILNE Auto-Start Co., 812 4th Ave., Detroit, Mich.

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CAMBRIA Steel Co., Arcade Bldg., Philadelphia, Pa.

CARNEGIE Steel Co., Pittsburg, Pa.

EASTERN Steel Co., Pottsville, Pa.

INLAND Steel Co., 1st National Bank Bldg., Chicago, Ill.

JONES & Laughlin's Steel Co., Pittsburg, Pa.

LOCKHART Iron & Steel Co., McKees Rocks, Pa.

LOGAN Iron & Steel Co., Harrison Bldg., Philadelphia, Pa.

PASSAIC Steel Co., Paterson, N. J.

PENNSYLVANIA Steel Co., Girard Trust Bldg., Philadelphia, Pa.

PHOENIX Iron Co., 410 Walnut St., Philadelphia, Pa.

REPUBLIC Iron & Steel Co., Frick Bldg. Annex, Pittsburg, Pa.

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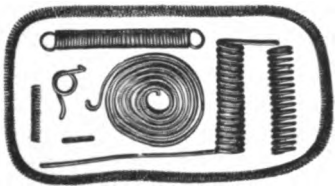
Small, Flat
Springs of any
Shape
for any Purpose



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M. D. HUBBARD SPRING COMPANY
Pontiac, Michigan

Inlet and Exhaust Valve Springs

sometimes cause trouble. We try to
produce springs which overcome this.

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Manufacturers of Small Springs, etc.

The Wm. D. Gibson Co.
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SPRINGS
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Steel, Brass and Phosphor Bronze
Special Shapes and Sizes to meet all requirements of Automobile Makers.

THE D'ARCY CUSHION SPRING COMPANY
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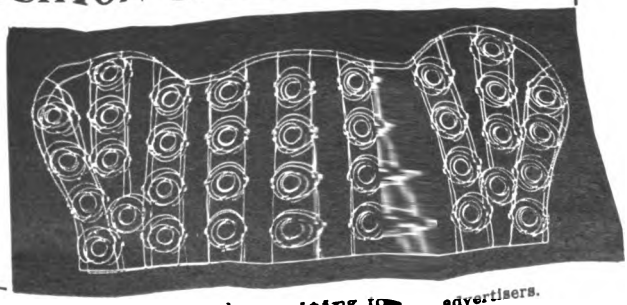
Write for prices if you want the best.
We can deliver the goods on time.
Make all kinds of Auto seat constructions.
All we ask is a comparison of quality and price.



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COLD ROLLED STRIP STEEL
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COLUMBIA Steel Co., Elyria, O.

CRUCIBLE Steel Co. of America, Pittsburg, Pa.

ELLIOTT-Blair Steel Co., Taylor & Newcastle Sts., Newcastle, Pa.

STANLEY Works, New Britain, Conn.

SUPERIOR Steel Co., Carnegie, Pa.

TOOL STEEL

BALDWIN Steel Co., 133 Reade St., New York, N. Y.

BETHLEHEM Steel Co., S. Bethlehem, Pa.

BRAEBURN Steel Co., Braeburn, Pa.

BROWN & Co., 10th St. & Duquesne Way, Pittsburg, Pa.

CARPENTER Steel Co., Reading, Pa.

COLONIAL Steel Co., Keystone Bldg., Pittsburg, Pa.

COLUMBIA Tool Steel Co., Chicago Heights, Ill.

CRUCIBLE Steel Co. of America, Pittsburg, Pa.

CYCLOPS Steel Works, Titusville, Pa.

DAMASCUS Nickel Steel Co., Carnegie, Pa.

FARIST Steel Co., Bridgeport, Conn.

HALCOMB Steel Co., Syracuse, N. Y.

HELLER Bros. Co., Newark, N. J.

ILLINGSWORTH Steel Co., John, Frankford, Philadelphia, Pa.

LUDLOW Steel & Spring Co., Pompton, N. J.

MIDVALE Steel Co., Nicetown, Philadelphia, Pa.

NEW Brighton Steel Co., New Brighton, Pa.

NORWALK Iron & Steel Co., Norwalk, O.

PHILADELPHIA Forge Co., 20 Cliff St., New York, N. Y.

VULCAN Crucible Steel Co., Aliquippa, Pa.

SPRING STEEL

AMERICAN Tube & Stamping Co., Bridgeport, Conn.

AMERICAN Steel & Wire Co., The Rookery, Chicago, Ill.

BRAEBURN Steel Co., Braeburn, Pa.

CAMBRIA Steel Co., Arcade Bldg., Philadelphia, Pa.

CARNEGIE Steel Co., Pittsburg, Pa.

COLONIAL Steel Co., Pittsburg, Pa.

COLUMBIA Steel Works, Elyria, O.

CRUCIBLE Steel Co. of America, Pittsburg, Pa.

HARROW Spring Co., Kalamazoo, Mich.

MIDVALE Steel Co., Nicetown, Philadelphia, Pa.

PENNSYLVANIA Steel Co., Girard Bldg., Philadelphia, Pa.

PHILADELPHIA Forge Co., 20 Cliff St., New York, N. Y.

SWEET'S Steel Co., Williamsport, Pa.

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BOKER &
York, N.

CARBON

CARPENT

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Pa.

DAMASCU

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HELLER

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KRUPP—S

MIDVALE
Pa.

NEW Proc

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York, N.

PROSSER
York, N.

ROYAL M
York, N.

SIER-Bat
York, N.
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CARPENT

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When you buy Induction Spark Coils, Switches, Plugs, Timers, Storage Batteries, and all other Electric Accessories for your trade, you may be getting good ones, but if you want to be sure, if you want a **guarantee** that they are good, see that the name

SCHUG

is on them. The far-reaching reputation of Schug electric goods is due to just two facts: They are made of the finest material obtainable; they are made by practical electrical men, not theorists.

SCHUG INDUCTION SPARK COILS have been proved "tried and true." Their reliability has standardized them among motor boat and automobile enthusiasts. They are primarily dependable, built to get all the speed possible out of your engine.

SCHUG ACCESSORIES, among which the Double Core Mica Plug and Schug Timers have been so highly commended, are all as perfect as the Schug Speed Coil.

OUR TIMERS are Ball Bearing and superior to any others on the market.

We also make:

Spark Coils	**Switches**	**Ignition Dynamos**
Mica Spark Plugs	**Primary Wire**	**Magnetos**
Timers	**Secondary Wire**	**Portable Battery Lamps**
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SCHUG ELECTRIC MFG. CO.

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BLUE CHIP—See Wheelock, Lovejoy & Co.

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CAPITAL—See Nash & Co.

EXCELSIOR—See Royal Metal Steel Co.

FRASSE & Co., Peter A., 92 Fulton St., New York, N. Y. (Importers). "Poldi."

HALCOMB Steel Co., Syracuse, N. Y. "Saben."

HELLER Bros. Co., Newark, N. J.

HOBSON, Houghton & Co., 19 Cliff St., New York, N. Y. (Importers). "Albion."

INTERNATIONAL High Speed Steel Co., Franklin Square, New York, N. Y.

JESSOP & Sons, Wm., 19 John St., New York, N. Y. (Importers).

JONES & Co., B. M., 141 Milk St., Boston, Mass. (Importers). "Mushet."

MIDVALE Steel Co., Nicetown, Philadelphia, Pa.

MUSHET—See Jones & Co.

NASH & Co., Geo., 224 Pearl St., New York, N. Y. (Importers). "Capital."

PHILLIPS & Sons Co., F. R., Penn Bldg., Philadelphia, Pa. "Velos."

POLDI—See Frasse & Co.

ROYAL Metal Steel Co., 24 State St., New York, N. Y. (Importers). "Excelsior."

SABEN—See Halcomb Steel Co.

VELOS—See Phillips & Sons Co.

VULCAN Crucible Steel Co., Aliquippa, Pa.

WARDLOW, S. & C., 95 John St., New York, N. Y. (Importers).

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ALLEN & Co., Edgar, 51 John St., New York, N. Y. (Importers).

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COLUMBIA Steel Co., Chicago Heights, Ill.

CRUCIBLE Steel Co. of America, Pittsburg, Pa.

FIRTH-Sterling Steel Co., Pittsburg, Pa.

HOBSON, Houghton & Co., 19 Cliff St., New York, N. Y. (Importers).

HOUGHTON & Richards, 150 Oliver St., Boston, Mass.

ILLINGSWORTH Steel Co., John, Frankford, Philadelphia, Pa.

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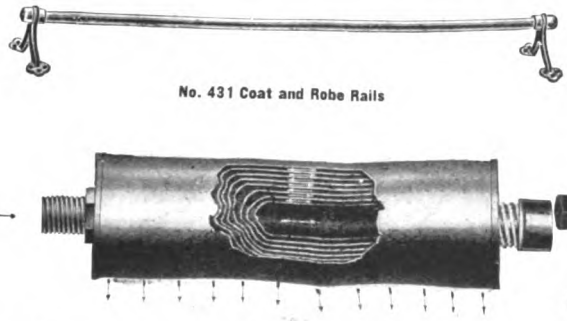
Ross Fluid Level Indicator for Gasoline Tanks



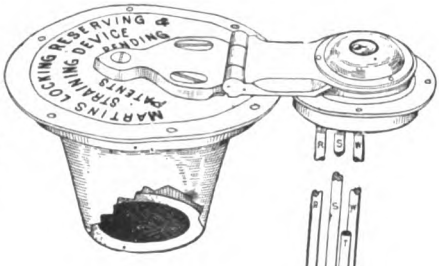
No. 431 Coat and Robe Rails

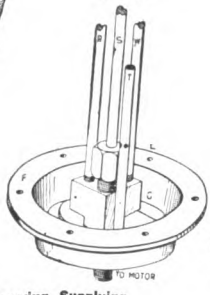
Turner Muffler and Exhaust Cooler

Martin Reserve and Lock Valve

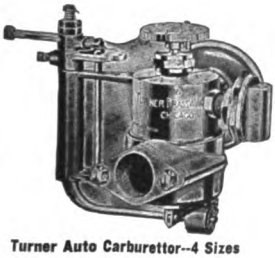
Martin Multiple Feed Lubricator

Martin Gasoline Strainer



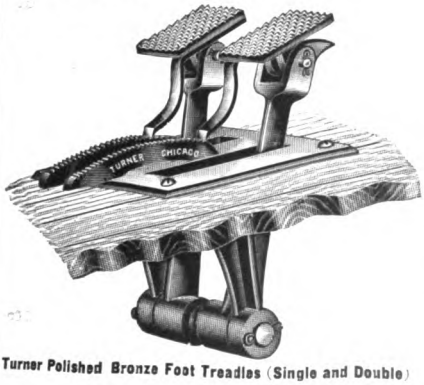


Martin Locking, Reserving, Supplying and Straining Device

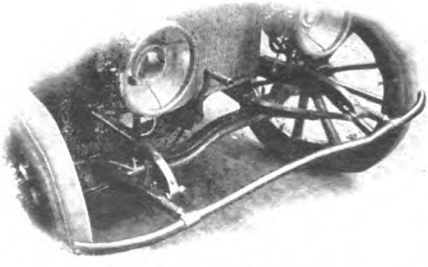


Turner Auto Carburettor--4 Sizes

No. 530 Turner Foot Pump



Turner Polished Bronze Foot Treadles (Single and Double)



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STEVENS Co., Chas. L., 139 Beaubien St., Detroit, Mich.

WING Co., Chas., Amesbury, Mass.

WINSHIP, W. W., 71 Summer St., Boston, Mass.

STARTING CRANK STRAPS

(See Holders, Starting Crank)

SUPPLIES

DEALERS IN SUPPLIES

(This is a list of Dealers and Jobbers in Automobile Supplies who advertise in this publication)

ARNSTEIN, Eugene, 35th St. & Shields Ave., Chicago, Ill.
(See page 79.)

AUTO Accessories Mfg. Co., First & Congress Sts., Detroit, Mich.
(See page 219.)

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich.
(See page 193.)

AUTOMOBILE Supply Co., 1339 Michigan Ave., Chicago, Ill.
(See page 31.)

BECKLEY-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
(See page 213.)

BEHEN-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo.
(See page 31.)

EXCELSIOR Supply Co., 233-37 Randolph St., Chicago, Ill.
(See page 39.)

FRANCO-American Auto & Supply Co., 1404-6 Michigan Ave., Chicago, Ill.
(See page 113.)

MOTOR Car Supply Co., 1425-27 Michigan Ave., Chicago, Ill.
(See page 107.)

MUTUAL Auto Accessories Co., 1937 Broadway, New York, N. Y.
(See page 241.)

NEUSTADT Auto & Supply Co., St. Louis, Mo.
(See page opposite.)

NEW York Sporting Goods Co., 17 Warren St., New York.
(See page 171.)

SWITCHES

AUTOMATIC TIME SWITCHES

(Forautomatically turning the current on or off when charging storage batteries)

ABBOTT, Eugene B., Painesville, O.

AMERICAN Automatic Switch Co., Waterbury, Conn.

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for the Automobile

The Largest Parts and Jobbing House West of the Mississippi River

50,000 Square Feet Floor Space

OUR NEW HOME

Makers of—Running Gears, Bodies, Wheels of all types, Axles, Steering devices and Controls, Radiators, Tanks and Hoods, Fenders, Tops, etc.

Jobbers of—

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Peugeot Chains and Rims
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Goodyear Tires
Autoline Oils
"Ajax Tires," etc.

100 new and second Gasoline Engines for Sale and Exchange

The Growing House

Neustadt Automobile & Supply Company

St. Louis

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ELECTRIC SWITCHES (Continued)

SEIDLER-Miner Electric Co., 205-209 Jefferson Ave., Detroit, Mich. "Economy."
(See page 95.)

SPECIALTY Mfg. Co., South Norwalk, Conn.

SPLITDORF, C. F., 261-65 Walton Ave., New York City.
(See page 73.)

TRITT Electric Co., 301 S. Division St., Union City, Ind. "Rapid Fire."

WILLIAMS, E. Q., 535-39 S. Clinton St., Syracuse, N. Y.

ELECTRIC LOCK SWITCHES

AUTO Appliance Co., 24 Mechanic St., Newark, N. J.

AUTO Lock Co., 6546 Minerva Ave., Chicago, Ill.

AUTO-Lock Plug Co., 31 Nassau St., New York, N. Y.

BIRD—See Motor Specialty Mfg. Co.

BRANDOW Combination Lock Switch Co., 86 North St., Pittsfield, Mass.

GOEBEL, F. A., Marietta, O. "Snapit."

MOTOR Specialty Mfg. Co., 105 Washington St., Chicago, Ill. "Bird."

PITTSFIELD Spark Coil Co., Dalton, Mass.
(See page 73.)

STANDARD Auto Supply & Mfg. Co., 20 Broad St., N. Y. City.

STEERING-WHEEL SWITCHES

AMERICAN Motor Works, Grand Rapids, Mich. "Petite."

LACOSTE—See Rubay, Leon.

PETITE—See American Motor Works.

RUBAY, Leon, 1697 Broadway, New York, N. Y. (Importer). "Lacoste."

TACKS

UPHOLSTERY TACKS

BEMAN & Co., Binghamton, N. Y.

CLEVELAND Tack Works, Cleveland, O.

COBB & Drew, Plymouth, Mass.

EAGLE—See Turner & Seymour Mfg. Co.

GENESEE Tack Co., 35-57 Mt. Hope Ave., Rochester, N. Y.

GRAND Crossing Tack Co., S. Chicago Ave. & 79th St., Chicago, Ill.

MILWAUKEE Tack Co., Milwaukee, Wis.

NEW Haven Button Co., New Haven, Conn.

PLYMOUTH Mills, Plymouth, Mass.

RIPLEY & Bartlett, Water St., Plymouth, Mass.

SALMOND & Son, Sam, Hanover, Mass.

SHELTON Co., Derby, Conn.

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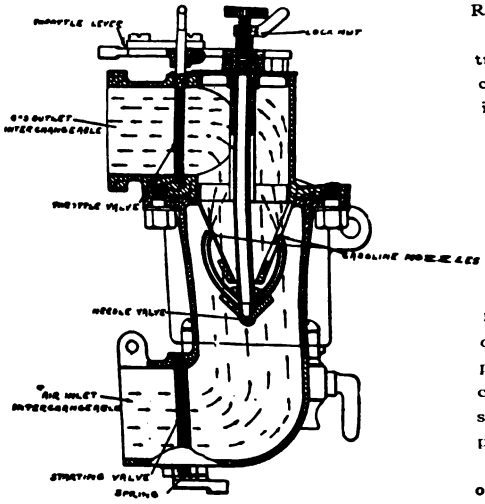
Mr. Manufacturer **Mr. Dealer**

YOU WANT **YOU NEED**

THE BUFFALO CARBURETOR

BECAUSE it saves you trouble, time and money. It is a mechanical Carburetor, Flexible, Reliable and Economical.



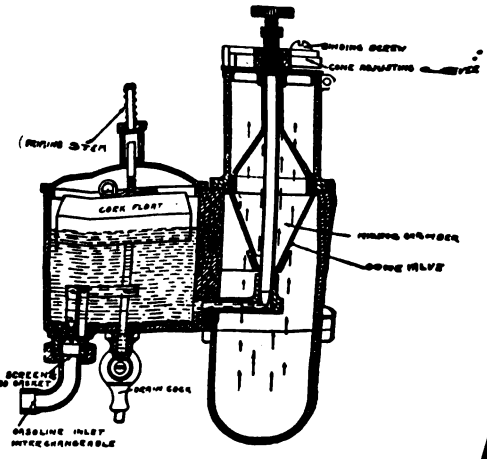
The **BUFFALO CARBURETOR** saves trouble because it gives complete mechanical control of the motor; it saves time because it has few parts; simple and permanent adjustments; it saves money because it produces greater horse-power per gallon of gasoline, and that means greater mileage, increasing the range of the Car.

The **BUFFALO CARBURETOR** varies the mixture to suit the conditions of load imposed. At the will of the operator greater flexibility cannot be obtained. It is devoid of springs, valves or other mechanism depending on atmospheric conditions for successful operation. All members are direct solid connections, giving the operator complete, positive control of his machine.

The BUFFALO CARBURETOR is the best on the market. It saves from 20 per cent. to 50 per cent. on gasoline consumption because its operation is based on scientific principles. The Ford six-cylinder car which won the 24-hour race in Detroit June 22nd, breaking all world's records, was equipped with a Buffalo Carburetor.

The "Haynes" Vanderbilt Cup Racer was equipped with a Buffalo. And all Thomas 1906 records were obtained with **BUFFALO CARBURETORS.**

The entering column of air passes the gasoline nozzle at adjustable openings in the cone valve. The cone valve and throttle are link-connected and move in unison, both are adjusted to give proper mixture for slow speed, as increased power or speed is desired. The cone valve and throttle are rotated by the operator increasing the quantity of mixture admitted, while the speed of the mixture passing the nozzles is kept the same. This feature insures a perfect mixture for all powers, prevents a greater quantity of fuel from being drawn by the motor than can be properly burned, and accounts for the great economy obtained with a 1908 mechanical Carburetor.



Write for full particulars and prices

THE BUFFALO CARBURETOR COMPANY

889 Main Street, Buffalo, N. Y.

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FUEL AND WATER TANKS
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GETCHELL & Son, S. S., Woonsocket, R. I.

GLOBE Machine & Stamping Co., Hamilton Ave., Cleveland, O.
(See page 49.)

HAYES Mfg. Co., 360-70 Maybury Ave., Detroit, Mich.
(See page 111.)

IRONCLAD Mfg. Co., 204 Varet St., Brooklyn, N. Y.

JANNEY, Steinmetz & Co., 4th & Market Sts., Philadelphia, Pa.
(See page 277.)

KELLS Mfg. Co., W. J., 60-62 Van Winkle Ave., Jersey City, N. J.

KINSEY Mfg. Co., 1126 E. 3rd St., Dayton, O.

KOVEN & Brother, L. O., 50 Cliff St., N. Y. City.

MANUFACTURERS' Can Co., 434 Mulberry St., Newark, N. J.

MULLINS Co., W. H., 124 Franklin St., Salem, O.

MURREY & Murrey, 113 Allegan St., E., Lansing, Mich.

NORTMANN-Duffke Foundry Co., 26th St. & Layton Ave., Milwaukee, Wis.

OFF & Co., Christian, 5 N. New Jersey St., Indianapolis, Ind.

OHIO Blower Co., 330 Prospect Ave., N. W., Cleveland, O.

PRESSED Steel Tank Co., Milwaukee, Wis.

SANFORD Mfg. Co., F. C., Bridgeport, Conn.

STANDARD Welding Co., Cleveland, O.

TRAGESER Steam Copper Works, John, 447-57 W. 26th St., New York, N. Y.

WESTERN Drop Forge Co., Marion, Ind.
(See page 15.)

WORCESTER Pressed Steel Co., Greendale, Mass.

WRIGHT Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill.

GASOLINE STORAGE TANKS AND SYSTEMS

ACME—See Wilson & Friend Co.

BOWSER & Co., S. F., Ft. Wayne, Ind.
(See page opposite.)

BOYER-Radford & Gordon Tank & Pump Co., Ice Ave., Dayton, O. "Dayton."

BROWN Oil Can Co., Dawson St., Toledo, O.

DAYTON—See Boyer-Radford & Gordon Tank & Pump Co.

DELPHOS Mfg. Co., Delphos, O.

EASTERN Oil Tank Co., 136 Fletcher St., Lowell, Mass.
(See page opposite.)

FREELAND Sons Co., B. F., Sturgis, Mich. "Pioneer."

GETCHELL & Son, S. S., Woonsocket, R. I.

GILBERT & Barker Mfg. Co., 82 4th Ave., New York, N. Y. "Springfield."

HYDRAULIC Oil Storage & Distributing Co., 820 Penobscot Bldg., Detroit, Mich. "Snells."

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FILL YOUR CARS MORE QUICKLY

The Bowser Portable Wheel Tank for Gasolene, used in connection with a Bowser Long Distance Outfit, enables you to instantly fill any car, no matter how large or how crowded your garage may be. Instead of pushing the heavy cars within range of the pump, just wheel the gasolene to each car. You can wheel the tank onto the sidewalk to fill a car at the curb. It is noiseless and easy to handle and absolutely safe

For complete description and information, send for Bulletin 5412.

Cut 121—Portable Wheel Tank

S. F. BOWSER & CO., Inc.,

FORT WAYNE, - - - - - INDIANA

255 Atlantic Ave., BOSTON, MASS. | 299 Broadway, NEW YORK CITY | 209-210 Fisher Bldg., CHICAGO, ILL. | 66-68 Frazer Ave., TORONTO, ONTARIO

SAVE MONEY—SAVE TIME—PROTECT AGAINST FIRE WITH

"The Eastern 1907 Model" Gasolene Tank

LONG DISTANCE—SELF MEASURING.
THE BEST—SAFEST—MOST ECONOMICAL.

The only MODERATE PRICED and MODERN high-grade self-measuring gasolene pump with solid steel tank on the market to-day. Not one drop of gasolene can be wasted; no evaporation whatever, as the tank is made of heavy galvanized steel that will practically last a life-time. Tank can be buried any distance from building which eliminates all danger of fire or explosion.

You are paying from five to seven cents more for each gallon of gasolene you buy than you should unless you use

"THE EASTERN."

"The Eastern" is especially adapted for retail purposes or for private garage. This outfit pumps a quart or two quarts at one stroke of the lever. It has Anti-Drip Nozzle, Shut-off Cocks and Stuffing Boxes, making evaporation impossible, and keeps your gasolene always fresh.

By far the best and cheapest outfit on the market Its advantages are manifold. Write for details.

EASTERN OIL TANK CO., 136 Fletcher St., Lowell, Mass. U.S.A.

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(See Fittings, Pipe)

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BARCY & Nicholson, Detroit, Mich.

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BRIGGS, W. H., 424 Bedford Ave., Brooklyn, N. Y.

DUPLEX—See Bliss-Chester Co.

HERZ & Co., 203-205 Lafayette St., N. Y. City.

LACOSTE—See Rubay, Leon.

LOMBARDI Motor Co., 71 Minerva St., Derby, Conn.

MIDLAND Supply Co., 1218 Michigan Ave., Chicago, Ill. "Quick Sure."

MOSLER & Co., A. R., 163 W. 29th St., N. Y. City.

NEVER-Miss Spark Plug Co., Lansing, Mich.
(See page 95.)

NOONAN Tool & Machine Works, 105 E. Dow St., Rome, N. Y.

PITTSFIELD Spark Coil Co., Dalton, Mass.
(See page 73.)

QUICK-SURE—See Midland Supply Co.

RAJAH Auto Supply Co., 140 Washington St., N. Y. City.

RUBAY, Leon, 1697 Broadway, New York, N. Y. (Importer). "Lacoste."

SHAIN, Chas. D., 70 Murray St., N. Y. City.

SPLITDORF, C. F., 261-65 Walton Ave., N. Y. City.
(See page 73.)

STANDARD Battery Connection Co., 27 Copeland St., Roxbury, Mass.

TREGONING Electric Mfg. Co., 224 High Ave., S. E., Cleveland, O.

TESTERS

BATTERY TESTERS

(See Gauges, Battery)

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(See Hydrometers)

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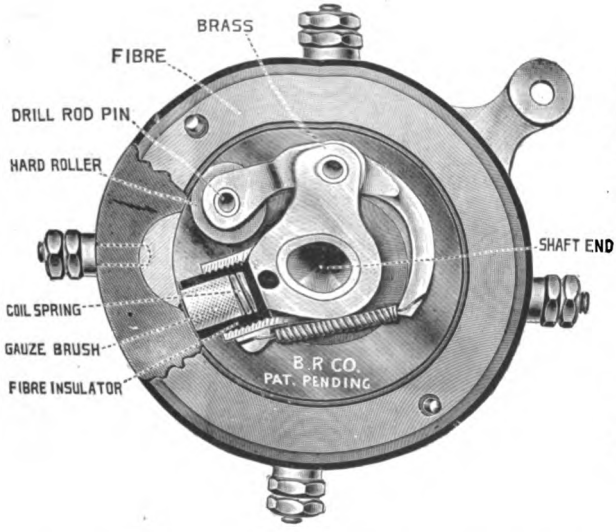
"Everlastingly Good"

The MAXIMUS SELF CLEANING TIMER

More Power

Less Plug Trouble



More Speed

Less Coil Trouble

Maximus timers are designed to overcome the weak points of the roller type and to add to the engine's efficiency by giving a positive and accurate current to the spark coils. The objections to the roller type are, the necessity of a long contact, the wearing of the roller and pin and the distributing of metal, dirt and worn particles on the contact surface. These objections are overcome in the **Maximus** by means of an insulated gauze brush, lightly pressed against the contact surface, scraping away any dirt accumulation or any black deposit formed by the arc at the breaking of the contact.

This gives a bright, clean surface at all times, allowing of shorter contact segments and by the use of a ground contact plunger contained in the cap or cover, the current consumption is greatly reduced. An extra large roller is employed, same revolving only three and one-half turns to a complete revolution. This saves the wear on the pin.

The end of the shaft is extended into a bearing in the cap or cover which relieves the wear on the main bearing. The outside edge of the fiber is exposed to the air which eliminates the bulging or swelling of same, as when this is enclosed in a shell or body, it is constantly soaked in oil or grease. This edge of the fiber is beveled and overcomes the liability of short circuiting the terminals. Descriptive matter explains why coil and plug troubles are due to poor timers.

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1 Cyl. $7.00 2 Cyl. $7.50 3 Cyl. $7.75 4 Cyl. $8.00 6 Cyl. $9.00

Made by

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KENT Mfg. Works, Atwater, 50 North 6th St., Philadelphia, Pa.
(See page 95.)

KOKOMO Electric Co., Kokomo, Ind.

LACOSTE—See Rubay, Leon.

LEAVITT—See Uncas Specialty Co.

LINDSAY, A. M., Jr., 187 N. Water St., Rochester, N. Y.

LITTLE GIANT—See Herbert & Franchi.

McQUOWN—See Monitor Speed Recorder Co.

MARINE & Auto Specialty Co., 233 Randolph St., Chicago, Ill. "Sintz."

MASSNICK Mfg. Co., 1559 Jefferson Ave., W., Detroit, Mich.

MAXIMUS—See Beckley-Ralston Co.

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MONITOR Speed Recorder Co., 274 Pearl St., Cambridge, Mass. "McQuown."

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NEWCOMB, A. H., 815 W. 21st St., Chicago, Ill. "Star."

PEERLESS Equipment Co., 170 S. Clinton St., Chicago, Ill.

PERFECT—See Youse, E. S.

PITTSFIELD Spark Coil Co., Dalton, Mass.
(See page 73.)

POWELL Muffler & Timer Co., 44 La Fayette St., Utica, N. Y.
(See page 157.)

QUAD Mfg. Co., 35-37 S. Scioto St., Columbus, O.
(See page opposite.)

RUBAY, Leon, 1697 Broadway, New York, N. Y. (Importer). "Lacoste."

ROBERT Instrument Co., 49 Shelby St., Detroit, Mich.
(See page 95.)

SCHAAL, W. R., 27 N. Jefferson St., Chicago, Ill.

SCHUG Electric Mfg. Co., 321 Jefferson Ave., Detroit, Mich.
(See page 203.)

SINTZ—See Marine & Auto Specialty Co.

STAR—See Newcomb, A. H.

UNCAS Specialty Co., 25 Shipping St., Norwich, Conn. "Leavitt."

WESTERN Motor Co., Logansport, Ind.
(See page 57.)

WILSON—See Midland Supply Co.

YOUSE, E. S., 46 N. 5th St., Reading, Pa. "Perfect."

ZIMMERMAN-Smith Co., N. Tonawanda, N. Y.

TIPS

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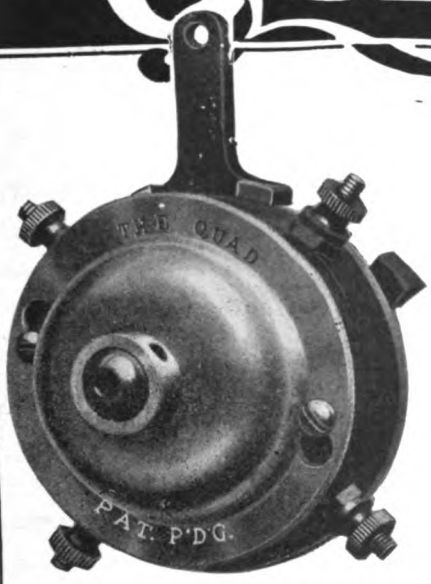
The QUAD Timer



A masterpiece of modern inventive ingenuity, every detail finished and constructed in a superlatively high degree under our own patents.

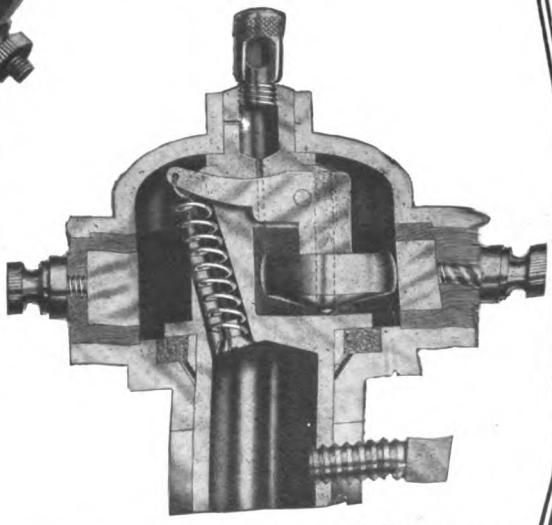
When you have used one of our timers we will have proved to you that our timers are like our business methods—right up to the minute.

Our timer is small, neat, compact, with double bearing to eliminate the eccentric wear on one journal, crowned roller supported in a position to allow the centrifugal force to insure a perfect contact.

Self-oiling, actually dust-proof, perfectly noiseless, delivers the full current from the batteries to the coil, and is guaranteed to show higher efficiency than any other timer on the market.

We will send a sample timer to responsible concerns and if it is not as represented it can be returned at our expense.

Liberal discounts to the trade and special inducements to the manufacturers.



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CONSOLIDATED Rubber Tire Co., 40 Wall St., N. Y. City.

DIAMOND Rubber Co., Akron, O.
(See page 225.)

FIRESTONE Tire & Rubber Co., Miller St. & Sweitzer Ave., Akron, O.

GOODRICH Co., B. F., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

HARTFORD Rubber Works Co., Hartford, Conn.

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MAHONING Rubber Co., Youngstown, O.

MORGAN & Wright, Detroit, Mich.
(See page opposite.)

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PENNSYLVANIA Rubber Co., Jeannette, Pa.

REPUBLIC Rubber Co., Youngstown, O.

SWINEHART Clincher Tire & Rubber Co., Akron, O.
(See page opposite.)

SPECIAL TIRES

AMERICAN Auto Tire Co., Toledo, O.

COMMONWEALTH Rubber Co., Reading, Mass. "Mitchell."

HUBBARD—See Middleton, Arthur H.

MIDDLETON, Arthur H., 2821 Broad St., Philadelphia, Pa. "Hubbard."

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NEVER-Miss Spark Plug Co., Lansing, Mich.
(See page 95.)

ONWARD Co., 531 W. 15th St., Chicago, Ill.

WEEBER Mfg. Works, C. F., Albany, N. Y.

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stand pre-eminent among auto tires

in the quality and quantity of service given for every dollar of cost

They positively reduce the cost of car maintenance

Clincher—Dunlop—Bailey "Won't Slip" Tread.

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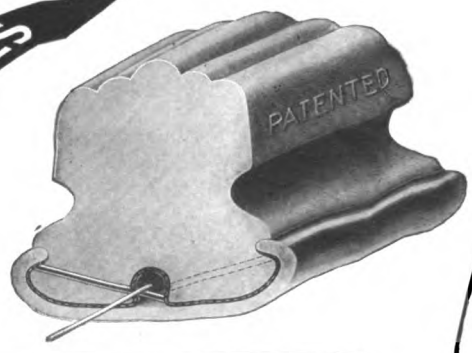
Swinehart TIRES

Four years in the business. Must be good.



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AMESBURY Top Co., Cedar St., Amesbury, Mass.

ANDERSON & Co., F. W., 729 N. Uber St., Philadelphia, Pa.

AUTOMOBILE Equipment Co., 264 Jefferson Ave., Detroit, Mich. (See page 193.)

AUTO Accessories Mfg. Co., Detroit, Mich. "Sterling." (See page opposite.)

AUTO Top Co., 209 E. Columbia St., Fort Wayne, Ind. (See page 279.)

AUTO Top & Trimming Co., Pontiac, Mich.

AUTOMOBILE Buggy Top Co. of America, Noxen, Pa.

AUTO Cape Top Co., 1465 Michigan Ave., Chicago, Ill.

AUTO Equipment Co., 1424-6 Michigan Ave., Chicago, Ill.

BALTIMORE Buggy Top Co., Baltimore, Md.

BARTON Mfg. Co., Springfield, O.

BAUER Bros., 937 W. 8th St., Cincinnati, O.

BLASIER Mfg. Co., M. E., 63 Columbia St., Utica, N. Y. (See page 259.)

BLISS, Chas. P., Denver, Colo.

BRIDGEPORT Vehicle Co., South Ave. & Water St., Bridgeport, Conn.

BROC Carriage & Wagon Co., E. 40th St. & Payne Ave., Cleveland, O.

BROWN Auto Top Co., Philadelphia, Pa.

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BUOB & Scheu, 408-410 Court St., Cincinnati, O.

CAPITOL Auto Co., 130-32 E. New York St., Indianapolis, Ind.

CASE & Phelps, 1257 Niagara St., Buffalo, N. Y.

CHICAGO Carriage & Trimming Co., 1908 Indiana Ave., Chicago, Ill.

CHICAGO Coach & Carriage Co., 1223 Michigan Ave., Chicago, Ill.

COLLINS & Son, G. A., Akron, O.

COLLINSON, M., 1253 Michigan Ave., Chicago, Ill.

CRAY Bros., 1244 Ninth St., N. W., Cleveland, O.

CRESCENT Auto Top Co., 58 W. 43d St., N. Y. City.

CUTTER, J. Frank, 414 Main St., Cambridge, Mass.

DENNISTON, E. E., 184 W. Mohawk St., Buffalo, N. Y.

DETROIT Auto Top Co., Detroit, Mich.

DETROIT Motor Car Supply Co., 1250 Jefferson Ave., Detroit, Mich.

DUANE & Co., W. J., 304 W. 54th St., N. Y. City.

DUNHAM & Son, D. B., 128 Irving St., Rahway, N. J.

ECLIPSE Buggy Co., Nelson & Wall Sts., Ft. Wayne, Ind.

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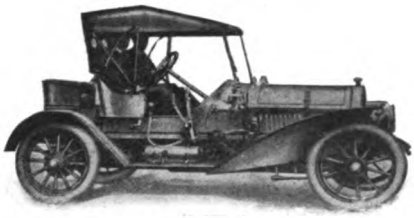
1908 SPECIAL RUNABOUT TOP



1908 STANDARD TOURING CAR TOP

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Our Superior Facilities and Large Capacity insure PROMPT SERVICE
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AUTO ACCESSORIES MFG. CO.

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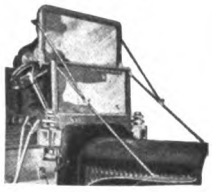
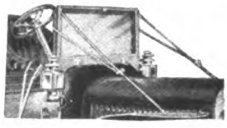
Three Models





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A Good, Serviceable Top,

Made of the best material and by skilled workmen, is what you want, isn't it?

One backed by a guarantee that it won't sag, bend or break, but give perfect satisfaction.

That's the Myers Way of making Tops. EVERY ONE MUST BE PERFECT. We've made a reputation for Quality and must keep it. Write us for Catalog and Prices. It's economy.

THE
MYERS AUTO TOP CO.
DAYTON, OHIO

Automobile Tops of Every Description
We also make Perfect Fitting Tire Covers

Vesco Tops

"A TOP FOR EVERY CAR."

TO
AUTOMOBILE
MANUFACTURERS

WE are now ready to take up with you the question of TOPS for your 1908 output. "VESCO TOPS" have "made good" for others, can we not interest you?

We have all that the "other fellow" has and, THEN SOME! A postal will bring information, or, if you desire, a special representative to see you. Write today.

Look for us at the Chicago Show.

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Auto Dept. 902 Cass Ave.,
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PARIS Auto Top Co., 236 W. 41st St., New York.

PARSONS Buggy Top Co., 70 W. Jackson Blvd., Chicago, Ill.

PEASE & Sons, S. C., Main St., Merrimac, Mass.

RANDS Mfg. Co., 51-55 Macomb St., Detroit, Mich.

RITTER Mfg. Co., 63 Amsterdam Ave., Detroit, Mich.

ROBBINS & Co., Irvin, 32 E. Georgia St., Indianapolis, Ind.

RUSSELL, H. J., 32 Exchange St., Worcester, Mass.

ST. LOUIS Buggy Top Co., 2117-19 North 9th St., St. Louis, Mo.

SCHUBERT Bros. Gear Co., 42-44 Cedar St., Oneida, N. Y.

SHAFFER Carriage Co., 938 N. Illinois St., Indianapolis, Ind.

SHIELDS Carriage Co., 11 Carriage Ave., Amesbury, Mass.

SNOW & Co., N. H., Binghamton, N. Y.

SPRAGUE Umbrella Co., Norwalk, O.

SPRINGFIELD Auto Top & Upholstering Co., 102-06 Dwight St., Springfield, Mass.
(See page 279.)

SPRINGFIELD Metal Body Co., 387 Birnie Ave., Brightwood, Mass.
(See page 279.)

STERLING—See Auto Accessories Mfg. Co.

STONE & Sons, C., 167-77 Ogden Ave., Chicago, Ill.

STUDEBAKER Bros. Mfg. Co., 378 Wabash Ave., Chicago, Ill.

TEEL Mfg. Co., 132 Main St., Medford, Mass.

TROY Carriage Sunshade Co., Troy, O.

UNITED STATES Dash & Fender Co., 147 E. 42d Street, N. Y. City.

VEHICLE Top & Supply Co., 902 Cass Ave., St. Louis, Mo. "Vesco."
(See page 219.)

VESCO—See Vehicle Top & Supply Co.

WARNER Pole & Top Co., 1648 Central Ave., Cincinnati, O.

WAUGH & Co., Chas., 856-864 Main St., Cambridge, Mass.

WAYMAN & Murphy, 257 W. Randolph St., Chicago, Ill.

WEISS & Son, Chas., 4800 Cottage Grove Ave., Chicago, Ill.

WOOD & Son, Fred'k R., 219 W. 19th St., N. Y. City.

ZIMMERMAN & Sons, F. F., Main St., Waupun, Wis.

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GASOLINE TORCHES AND FURNACES

ACORN Brass Mfg. Co., 51 N. Peoria St., Chicago, Ill.

AMERICAN Stove Co., St. Louis, Mo.

BARTHEL Blow Lamp Co., Boston, Mass.

BEST I

BRIDG

CLAYT Mich.

GEFRO Philac

HOLLA Ill.

HULL more.

KNAPF N. Y.

RESER Ave.,

SCHNE

TURNE (See I

WELLI New

DETA

ADWE Washi

AKRON Akron

AMERI Servis

BAILEY ton, M

BOSTO Bosto

BUFFA Erie

DURAN

GREEN Protec

HEALY N. Y. (See I

INVINC

INNER Rapid

KIMBA Counc

LEATH per F (See I

MAPLE

PERFE

REPUB 53d St

RUBAY N. Y.

SAMSON Broad (See I

S. C. way,

SLAMA

WOODY

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TOPS

TOPS

Every feature of correct Top Construction is found in The LONDON Tops.

They are built on proper lines of proper materials and have that proper Auto style necessary to a properly equipped car.

LONDON AUTO SUPPLY CO.
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NOW is the time to get in line for 1908

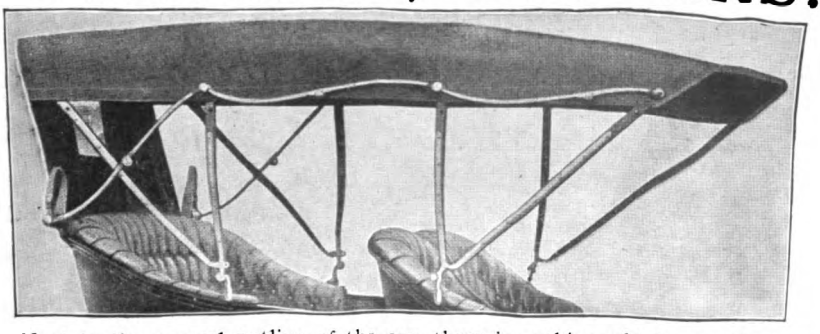
THE KING TOP MANUFACTURING CO.
DAYTON OHIO

TOPS THAT FIT

WRITE FOR PRICES

KING TOP MFG. CO.,
Dayton, Ohio.

ATTENTION, DEALERS!



Next to the general outline of the car, there is nothing which appeals more to the buyer's eye than a properly fitting and proportioned top. A top built in proportion for a large seven-passenger touring car, would be too heavy and clumsy in appearance for a light touring car. All our tops are built to correspond with the general outline of the car they are intended for, and a properly fitting top helps to sell automobiles. **Dealers,** insist upon having your cars equipped with our tops, and if your manufacturer refuses to do this, take up the matter with us direct. We have the necessary measurements of all automobiles, and our tops can be easily attached to the car. Our sales for 1907 are over 200 per cent. greater than in 1906. There must be a reason. *Send for catalog and prices.*

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CLOTH AND CARPET TRIMMINGS

(See also Broadcloth; also Buttons; also Carpet; also Cloth; also Lace; also Linoleum; also Silk; also Whipcord)

ADAMS, Wm. F., 339 B'way, N. Y. City.

BRIDGEPORT Coach Lace Co., 805 Wood Ave., Bridgeport, Conn.

CARR, F. S., 74 Pearl St., Boston, Mass. (See page 285.)

CHANDLER Oil Cloth & Buckram Co., East Taunton, Mass.

CHASE & Co., L. C., 89 Franklin St., Boston, Mass. (See page 123.)

DERBY & Co., W. E., 34 Greene St., New York, N. Y.

DUSENBURY, Louis, 86-88 Worth St., New York, N. Y.

GERHAB, Jacob, 158-164 No. 3d St., Philadelphia, Pa.

GIFFORD & Son, John A., 25 Park Pl., New York, N. Y.

HODGMAN Rubber Co., 806 Broadway, N. Y. City.

HORSTMAN Co., Wm. H., 5th & Cherry Sts., Philadelphia, Pa.

HOWELLS Bros., 78 Worth St., New York, N. Y.

LAIDLAW, Jr., Wm. R., 244-250 W. 49th St., New York, N. Y. (See page 245.)

LANDERS Bros. Co., Toledo, O., & Boston, Mass. (See page 285.)

MANUFACTURERS' Selling Co., 1777 Broadway, New York, N. Y.

MONARCH Rubber Co., 41 N. 7th St., Philadelphia, Pa.

MUTTY Co., L. J., 28 Summer St., Boston, Mass. (See page opposite.)

PATTERSON & Greenough, 346 Broadway, New York, N. Y.

RARITAN Woolen Mills, 14 White St., N. Y. City.

ROEHM & Davison, Woodbridge & Wayne Sts., Detroit, Mich.

SCHLEGEL Mfg. Co., 27 Canal St., Rochester, N. Y.

SLATER & Sons, S., 47 Worth St., New York, N. Y.

VOGT Mfg. & Coach Lace Co., 332-334 St. Paul St., Rochester, N. Y.

WIESE & Co., Wm., 66-68 Greene St., New York, N. Y.

METAL TRIMMINGS

(See also Fasteners, Curtain; also Fittings, Top; also Forgings, Drop; also Handles, Door; also Hinges, Door; also Locks, Door; also Irons, Slat; also Irons, Top; also Mouldings, Brass; also Rests, Bow; also Separators, Bow)

AMESBURY Brass & Foundry Co., Amesbury, Mass. (See page 80.)

BARLO
BLAKE
COOPS Mass.
COWLE New H
CURRY Newar (See p
DOUGL Ave., I
ENGLIS New H
GLOBE Detroi
IMPERI ferson (See p
METAL City.
MURDO Cincin
MURPH
NON-CC Mass.
SCHERI Detroi
SMITH St., De (See p
TAYLOR falo, N
TURNEI (See p
VICTOR City.
WHITE port, C
WING C
WOODR Carmel

A

BOYLE N. Y. (
FULLER St., Ha
HASKEI Ill.
MASON, ton, M
NOLAN, Mass.
SAGE'S
TAYLOR St., Cl
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Favorite Seat Irons
Goose Necks
Prop Rests
Dash Brackets
Foot Board Moulding
Coat or Robe Rails
Foot Rails and Rests
Dash Rails

Deck Rails
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Footman Loops
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All Grades and Colors
IN BOTH
Foreign and Domestic Fabrics

We make a SPECIALTY of DOUBLE TEXTURE MACKINTOSH CLOTHS for Automobile Tops, Curtains, Slip Covers, etc., and our SPECIAL FEATURE is the COLOR of our domestic Twills, Drills, Jeans and Sateens. These are as near absolutely fast color as it is possible to dye either cotton or wool. After five weeks test in the open air, exposed to the sun and rain, the change is hardly noticeable

Samples and Price List cheerfully furnished on application. Write Us.

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(For Complete Tires—See Tires,Pneumatic)

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ALPHA—See Parker, Stearns & Co.

AMAZON—See Niagara Rubber Co.

CONTINENTAL Caoutchouc Co., 43 Warren St., New York, N. Y. (Importers). (See page 255.)

CONTINENTAL Rubber Works, Erie, Pa.

DIAMOND Rubber Co., Akron, O. (See page opposite.)

EMPIRE Automobile Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

FIRESTONE Tire & Rubber Co., Miller St. & Swetzer Ave., Akron, O.

FISK Rubber Co., Chicopee Falls, Mass.

G & J Tire Co., 549 E. Georgia St., Indianapolis, Ind.

GOODRICH Co., B. F., Akron, O.

GOODYEAR Tire & Rubber Co., Akron, O.

GOSHEN Rubber Works, Goshen, Ind.

HARTFORD Rubber Works, Hartford, Conn.

MICHELIN Tire Co., Milltown, N. J.

MORGAN & Wright, Detroit, Mich. (See page 217.)

NIAGARA Rubber Co., 1 Lock St., Lockport, N. Y. "Amazon."

PARKER, Stearns & Co., 228 South St., New York, N. Y. "Alpha."

PENNSYLVANIA Rubber Co., Jeannette, Pa.

SHAWMUT Tire Co., 97 Bedford St., Bedford, Mass.

TRACTION Tread, Tire & Tube Co., 1695 Broadway, New York, N. Y.

TRENTON Rubber Mfg. Co., Trenton, N. J. (See page opposite.)

VICTOR Auto Tire & Tube Co., 220 Madison St., Passaic, N. J.

SPEAKING TUBES

BRIDGEPORT Coach Lace Co., 805 Wood Ave., Bridgeport, Conn.

COLUMBIA—See Hortsmann Co.

COWLES & Co., C., Chestnut & Water Sts., New Haven, Conn.

ENGLISH & Mersick Co., New Haven, Conn.

HORTSMANN Co., Wm. H., 5th & Cherry Sts., Philadelphia, Pa. "Columbia."

PARRY & Co., A. N., Amesbury, Mass.

PERPENTE Mfg. Co., New Haven, Conn.

SCHMID, Frank J., New York, N. Y.

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BRASS AND COPPER TUBING

AMERICAN Tube Works, 137 Milk St., Boston, Mass.

ANSONIA Conn.

BENEDIC bury, Cc

BRIDGEP

COE Bras

DALLAS, Ill. (D (See pa

FRENCH bins St.

IVINS Tu Station. (See pa

NEW Jer rison, N

RANDOL

ROME Br

UNITED St., Pr

WELLS

FLEX

AUTOMC erson I

FLOWEI

LOMBAI Derby,

MANHA 67th S N. Y.

SMITH Philad

TRIPAI Mott S (See p

H

S

BOSTOI Hamp

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CONTIN

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Special Tubing of SMALL Sizes and THIN Gauges for AUTOMOBILE Work
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WE ALSO MAKE

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DELAWARE Seamless Tube Co., Auburn, Pa.

DETROIT Seamless Steel Tubes Co., 833 River St., Detroit, Mich.

IVINS Tube Works, Elwood, Oak Lane Station, Philadelphia, Pa. (See page 225.

NATIONAL Tube Co., McKeesport, Pa.

PITTSBURG Seamless Steel Tube Co., Beaver Falls, Pa.

SEAMLESS Tube Co. of America, Frick Bldg., Pittsburg, Pa.

SHELBY Steel Tube Co., 1714 Frick Bldg., Pittsburg Pa.

STANDARD Welding Co., Cleveland, O.

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AUTOMOBILE TURNTABLES AND WHEEL TRUCKS

AUTO Supply & Storage Co., 1416 Madison Ave., Baltimore, Md. "Norwood."

BICYCLE Step Ladder Co., 63 Randolph St., Chicago, Ill.

ERNST'S Sons, C. F., 75 Lathrop St., Buffalo, N. Y.

FELLWOCK Automobile & Mfg. Co., 320 Upper 4th St., Evansville, Ind. "Ideal."

GIBBS-Brower Co., 150 Nassau St., New York, N. Y. "Sterling-Elliott."

IDEAL—See Fellwock Automobile & Mfg. Co.

LINK Belt Co, Chicago, Ill.

NORTH Pennsylvania Iron Co., Philadelphia, Pa.

NORWOOD—See Auto Supply & Storage Co.

PITLESS Turntable Co., Kansas City, Mo.

SKINNER & Skinner, 1337 Michigan Ave., Chicago, Ill.

SMITH Machine Co., H., 51 Godwin St., Paterson, N. J.

STERLING-ELLIOTT — See Gibbs-Brower Co.

WEBER Cycle & Supply Co., 6 Kiowa St., Colorado Springs, Col.

UNIONS

PIPE UNIONS

(See Fittings, Pipe)

TUBING UNIONS

ESSEX Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (See page 5.)

IMPERIAL Brass Mfg. Co., 241-49 S. Jefferson St., Chicago, Ill. (See page 57.)

LUNKENHE

POWELL Co. Cincinnati,

WILLIAMS

ANGLE,

AMERICAN St., Cincinn

BASHILIN C

BELFIELD Philadelphi

BELKNAP M

BOURBON C St., Cincinr

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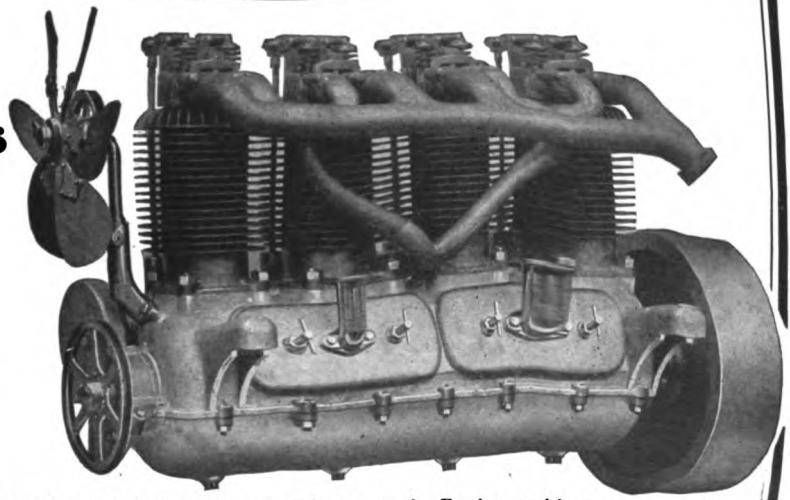

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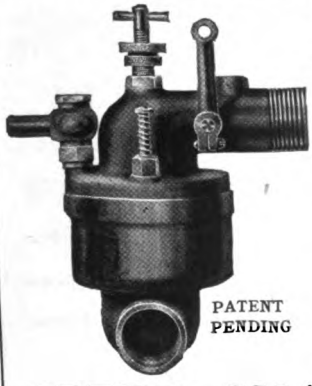

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MANUFACTURERS, it isn't sufficient to merely take our word for it, you must satisfy yourselves by a test—and be prepared to meet the demand, for air-cooled engines have come to stay—and you had better "get next" to the best—the "CARRICO."

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"Positively Guaranteed"

To Increase the power of the engine,
" Increase the speed of the engine,
" Deliver a perfectly uniform mixture at all engine [speeds,
" Economize in gasoline consumption,
" Start engine with very little cranking,
Or purchase price refunded after a trial of ten days.

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REGESTER'S Sons Co., J., Halliday & Saratoga Sts., Baltimore, Md.

SPRINGFIELD Brass Co., Springfield, O.

STANDARD Gauge Mfg. Co., 107 N. Franklin St., Syracuse, N. Y.

STEPHENS Mfg. Co., Roe, Detroit, Mich.

THOMAS Brass & Iron Co., Waukegan, Ill.

WALWORTH Mfg. Co., 132 Federal St., Boston, Mass.

WESTERN Tube Co., Kewanee, Ill.

WILLIAMS Valve Co., D. T., Cincinnati, O.

BALL CHECK VALVES

ESSEX Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

HATCHER Auto Parts Co., 140 Viaduct, Cleveland, O. (See page 5.)

LUNKENHEIMER Co., Cincinnati, O.

POWELL Co., Wm., 2125 Spring Grove Ave., Cincinnati, O.

TURNER Brass Works, Sycamore, Ill. (See page 205.)

WILLIAMS Valve Co., D. T., Cincinnati, O.

GASOLINE LOCK VALVES

HILL—See Janney, Steinmetz & Co.

JANNEY, Steinmetz & Co., 4th & Market Sts., Philadelphia, Pa. "Hill." (See page 277.)

MARTIN—See Turner Brass Works.

TURNER Brass Works, Sycamore, Ill. "Martin." (See page 205.)

GATE VALVES

(See Valves, Angle)

GLOBE VALVES

(See Valves, Angle)

MIXING VALVES

(See Vaporizers)

MUFFLER CUTOUT VALVES

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GARAGE Equipment Co., 201 22d St., Milwaukee, Wis. "Perfect."

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EATON
Conn.

LUNKE

POWE
Cinci

TURNE
(See

WILLI

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Mass.

CROSE
ver

LONER

LUNK
Cinci

PITTSI
St., P

SCHAE

STAR
St.,

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Force and Sight Feed Lubricator
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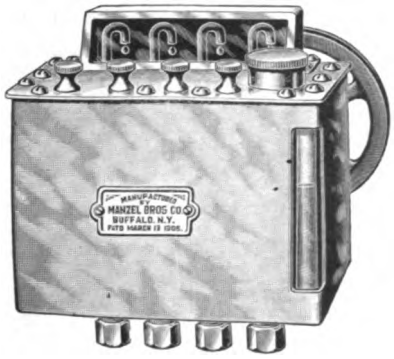

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Constant Sight Feed.

Made with any number of feeds —each feed being regulated independently.

Pulley or ratchet drive as desired.

Send for catalogue. ¶ Pumps on approval to manufacturers.

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The Original Single Tube Exhaust Blown Chime

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Pat. Nos. 821,358 and 797,681

A SIMPLE, EFFECTIVE AND DURABLE SIGNAL AT A MODERATE COST. HAS A DEEP, POWERFUL TONE THAT ALWAYS COMMANDS ATTENTION.

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Made in two sizes for **Exhaust, Steam or Air Pressure.**

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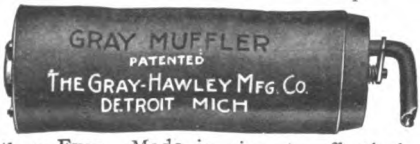
has proved its durability by years of faithful service.



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BELL—See Turner Brass Works.

LOCK Switch Mfg. Co., New York, N. Y.

SAVETY—See Artizan Brass Co.

TIRE Safety Device Co., New York, N. Y.

TURNER Brass Works, Sycamore, Ill. "Bell."
(See page 205.)

VANADIUM

AMERICAN Vanadium Co., Frick Bldg., Pittsburg, Pa.

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GENERATOR Valve Co., 294-96 Taaffe Place, Brooklyn, N. Y.

LUNKENHEIMER Co., Cincinnati, O.

VARNISHES

ACME White Lead & Color Works, Detroit, Mich.

ARMITAGE & Co., John L., Newark, N. J.

BABCOCK Varnish Co., 60 Pearl St., Boston, Mass.

BECKWITH-Chandler Co., 201 Emmett St., Newark, N. J.

BERRY Bros., Detroit, Mich.

BILLINGS-Chapin Co., Cleveland, O.

CALMAN, Emil, 100 William St., New York, N. Y.

CHASE, Roberts & Co., 5th St. & West Ave., Long Island City, N. Y.

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PICROME
(See page

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I

OVERH

ARDREY V N. Y.

IDEAL Carr Rochester,

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RYAN & Lo Wis. "Pe (See page

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BARNES Co (See page

HOBBS Mfg (See page

C

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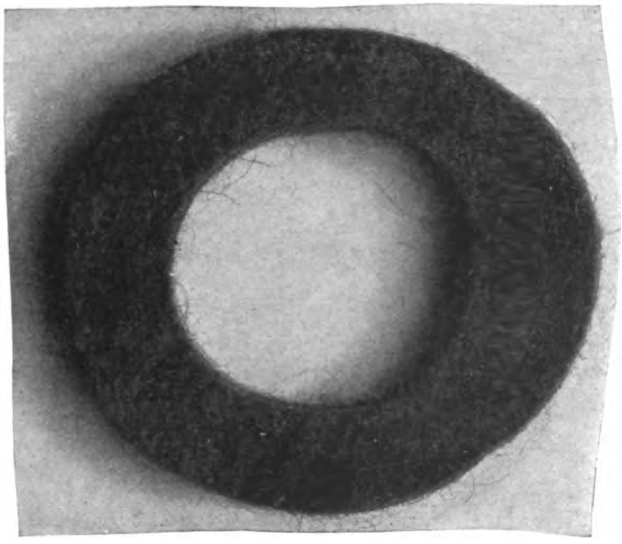

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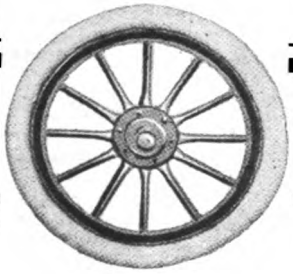
Automobile  WHEELS

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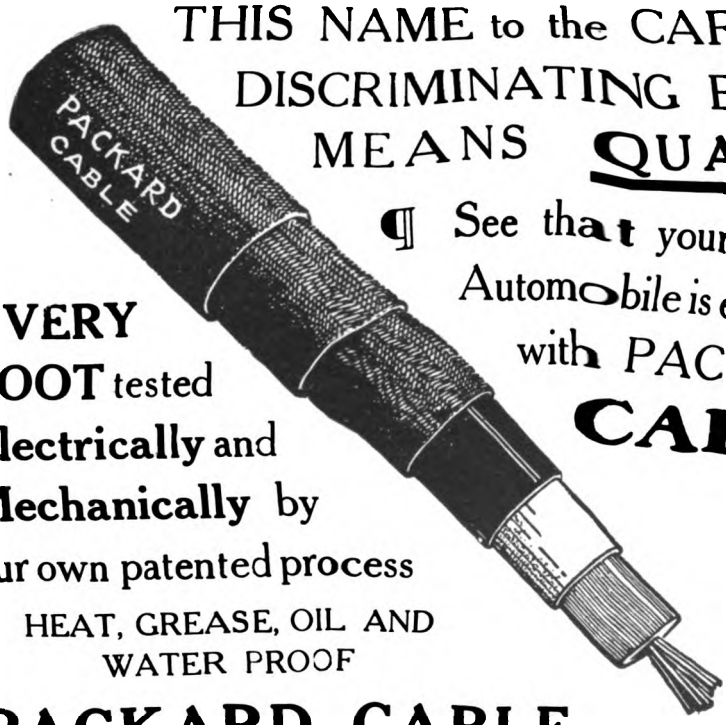

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(See page 253.)

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(See page 247.)

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HJORTH Wr "Empire."

INDIANAPOL & Downing ger."

IRLAND Pipe ton, Mass.

JANNEY, Ste Market S "Lowndes I (See page 2

KEYSTONE D

KEYSTONE M cott."

KILBORN & I

LEADER—See

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OSWEGO Tool

RIPLEY Pipe "Leader."

STILLSON—S

TIGER—See Ir

TRIMO—See T

TRIMONT Mf mo."

WALWORTH son."

WARREN Ax "American."

WELLS & Sor

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VALVE P

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CODMAN & S ton, Mass.

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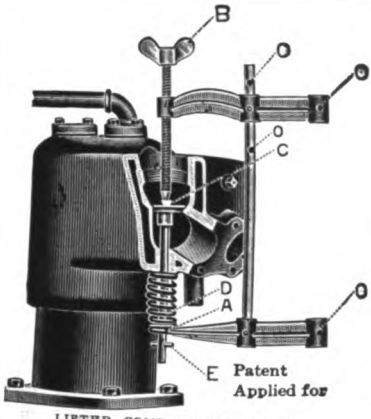

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Save Your Hands Save Time

Two Minutes to Remove Valve

W. & N.

Valve Lifter

It compresses the Spring and Lifts Washer so Key can be removed

No Loss of Patience No Injury to Hands

Simple Durable Practical

No owner of an Auto, Motor Boat, Gas or Gasoline Engine, or Garage as well, can afford to be without it.

Price, $2.00

DIRECTIONS

Place Fork "A" beneath washer or in coil of Spring "D." Turn Thumb Screw "B" until point sets on top of Valve "C." Then screw down until Spring "D" is compressed enough to remove Key "E."

To remove, back up on Screw "B," remove lifter and take out valve, so that necessary grinding, etc., can be done.

To replace valve back in position, simply reverse above instructions.

"O" represents adjusting holes for different lengths of cylinders and to get over or under exhaust pipes.

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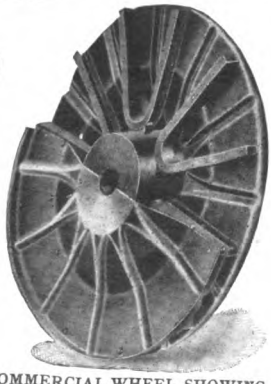

COMMERCIAL WHEEL SHOWING SPREADERS FOR SOLID TIRES

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TABLES AND DATA

REFERENCE TABLES FOR IF

It is often convenient to have a ready refer diate approximation to the horsepower of a mo are known. Such a table has been prepared by engineer, who gave permission to the editor c to publish it. One table gives the ratings of inches and fractions, and the other table gives the ı ments. Of course, in a table of this sort, an a: mean effective pressure and mechanical efficie represent average practice and the table is not when the most accurate results are desired.

It will be noted from Table I that in a very of engines with bore and stroke dimensions va 6-in. bore and 6 1-2-in. stroke is given. Simil in metric measurement, covering sizes from 70 ı bore and 165 mm. stroke. In Table I there is bore and stroke measurements between any two of 5 mm. In explanation of the tables, it will be diameter of the engine may be found, and in the with the column headed 0, the power of the en stroke of the same dimension. Columns 3 to 10 i for instance, the same bore, but having a stroke g at the top of the column. For example, referrin 4 inches in diameter and a stroke of 4 inches woul 4.27 i.h.p., as shown in the column headed 0; th has a cylinder bore of 4 inches and a stroke of is as shown in column 8, 5.89 i.h.p.

Similarly, for example, referring to Table II, an mm. would give 4.09 i.h.p., and an engine with a stroke would give 5.72 i.h.p.

It will be observed that to each bore dimensio given. The first of these gives the calculated pow ute, and the second the power at 1,000 revolutions speed are printed in italic type.

The powers given in the tables represent the c cylinder, and when multi-cylinder engines are bei table must be multiplied by the number of cylind

To determine the useful power or brake horse engine has to be considered. No general rule can b a little less than 80 per cent. of the indicated pow majority of four-cylinder engines of good design an unsuited to their design, and for powers of not less considered to be 85 per cent. within reasonably cl however, merely suggestive, and it is necessary to b formances to correctly estimate the brake horsepow of these small high-speed engines.

Very frequently an approximation to the calculat in the cylinders, is all that is required to be known, tables, for the two named speeds; *i.e.*, 750 or 1,oc speeds the difference may be taken as arithmetically according to the type and design of the engine.

Tables on page 242

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VICTOR

GRADUATING HYDRAULIC. DOUBLE ACTING.

SHOCK ABSORBER

Not the only device called a shock absorber

but the only device that absorbs a shock

WE WILL LEAVE THIS TO ANY PRACTICAL MAN

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It works in Oil with Graduating Rods.

Resistance regulated by By-pass.

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Horsepower Table I.—Cylinder Dimensions in Inches and Fractions.

Bore	0	¼	½	¾	1	¼	½	¾	2		
2	0.54	0.60	0.67	0.74	0.81	0.88	0.94	1.01	1.08		
	0.72	*0.80*	*0.89*	*0.98*	*1.08*	*1.17*	*1.25*	*1.35*	*1.44*		
2¼	0.76	0.84	0.92	1.01	1.09	1.18	1.26	1.35	1.43		
	1.01	*1.12*	*1.22*	*1.34*	*1.45*	*1.57*	*1.68*	*1.81*	*1.90*		
2½	1.04	1.15	1.25	1.35	1.46	1.56	1.67	1.77	1.88		
	1.39	*1.53*	*1.67*	*1.81*	*1.95*	*2.09*	*2.23*	*2.37*	*2.51*		
2¾	1.39	1.51	1.64	1.77	1.89	2.02	2.14	2.27	2.40		
	1.85	*2.02*	*2.19*	*2.36*	*2.53*	*2.70*	*2.87*	*3.04*	*3.20*		
3	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	3.00		
	2.40	*2.60*	*2.80*	*3.00*	*3.21*	*3.40*	*3.61*	*3.81*	*4.00*		
3¼	2.30	2.47	2.65	2.82	3.00	3.18	3.36	3.53	3.70		9
	3.06	*3.28*	*3.52*	*3.76*	*3.99*	*4.22*	*4.45*	*4.70*	*4.92*		
3½	2.86	3.06	3.27	3.48	3.68	3.88	4.09	4.30	4.50		10
	3.81	*4.09*	*4.36*	*4.63*	*4.90*	*5.18*	*5.45*	*5.72*	*6.00*		
3¾	3.53	3.76	4.00	4.35	4.47	4.71	4.95	5.18	5.41		105
	4.71	*5.02*	*5.34*	*5.65*	*5.97*	*6.28*	*6.60*	*6.91*	*7.23*		
4	4.27	4.65	4.81	5.08	5.35	5.61	5.89	6.15	6.41		110
	5.71	*6.06*	*6.42*	*6.78*	*7.13*	*7.50*	*7.85*	*8.20*	*8.55*		
4¼	5.13	5.44	5.74	6.04	6.34	6.64	6.95	7.25	7.55		115
	6.84	*7.24*	*7.64*	*8.05*	*8.45*	*8.85*	*9.25*	*9.66*	*10.06*		
4½	6.19	6.53	6.87	7.22	7.56	7.90	8.25	8.59	8.93		120
	8.25	*8.68*	*9.16*	*9.62*	*10.08*	*10.54*	*10.96*	*11.41*	*11.89*		
4¾	7.18	7.55	7.94	8.31	8.70	9.07	9.45	9.82	.....		125
	9.57	*10.07*	*10.57*	*11.09*	*11.58*	*12.08*	*12.59*	*13.09*	.....		
5	8.38	8.80	9.22	9.65	10.05	10.46	10.90	.....	.....		130
	11.16	*11.72*	*12.28*	*12.84*	*13.40*	*13.95*	*14.50*	.....	.....		
5¼	9.70	10.16	10.62	11.09	11.54	12.00	.....	.....	.....		135
	12.92	*13.54*	*14.15*	*14.76*	*15.40*	*16.00*	.....	.....	.....		
5½	11.12	11.65	12.15	12.66	13.15	.....	.....	.....	.....		140
	14.84	*15.51*	*16.20*	*16.86*	*17.54*	.....	.....	.....	.....		
5¾	12.71	13.27	13.82	14.38	.....	.....	.....	.....	.....		145
	16.96	*17.70*	*18.42*	*19.10*	.....	.....	.....	.....	.....		
6	14.45	15.05	15.65	.....	.....	.....	.....	.....	.....		150
	19.25	*20.05*	*20.85*	.....	.....	.....	.....	.....	.....		

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AUTOMOBILE

FERRO CYLINDERS

MARINE ENGINE

CYLINDERS of QUALITY

FERRO Cylinders and all Engine Castings are made by the "AIR FURNACE METHOD"

This is the method employed by the French. We are the only concern in America making this class of material by such an expensive method—a process which produces a casting of such toughness and close-grain as can be obtained by no other means. Uncle Sam specifies "Air Furnace" iron in all high-grade castings.

OUR METHOD OF CORE MAKING PRODUCES SMOOTH AND UNIFORM WALLS

FERRO MARINE ENGINES

We are the largest builders of marine engines in the world from blue print to finished engine. The engine of highest merit—merit of simplicity and durable design—merit of best workmanship.

CATALOG FREE, OR SEND 10 CENTS FOR TREATISE ON MARINE ENGINES.

FERRO product is fully guaranteed, backed by a reputation of an excellent equipped factory covering seven acres—organized, employing 600 skilled mechanics.

Quality Is Unequalled. Workmanship Is Unsurpassed.

When you get the FERRO you get the BEST

LET US FIGURE ON YOUR REQUIREMENTS

The FERRO MACHINE & FOUNDRY CO.

251 Wade Bldg., CLEVELAND, OHIO, U. S. A.

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TABLE OF G

GRADE	
Per Cent	Units
20	1 in 5
17	1 " 6
14	1 " 7
12.5	1 " 8
11	1 " 9
10	1 " 10
9	1 " 11
8	1 " 12
7.75	1 " 13
7	1 " 14
6.5	1 " 15
6.25	1 " 16
6	1 " 17
5.5	1 " 18
5	1 " 19
5	1 " 20
4	1 " 25
3.3	1 " 30
2.8	1 " 35
2.5	1 " 40

HILL-CLIMBING FORMULAS (

W = Weight of car and load in pounds.
w = Weight of car and load in tons.
H = Total ascent in feet.
L = Length of hill in feet.
R = Road resistance in pounds per to
r = Air resistance in pounds = $V^2 A$
V = Velocity of car in feet per second
A = Area of car in square feet present
T = Time occupied in ascent in secon
E = Efficiency of transmission of power
$H.P.$ = Effective horse power of engine.
p = Power given off at road wheels or
S = Speed of ascent in miles per hour

Then if P = Mean effective cylinder pressure
L = Length of stroke in feet.
A = Area of piston in square inches.
N = Number of useful or firing strokes

the brake horse-power of petrol or steam engines, ha

$$\frac{EPLAN}{33000}$$

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WILLIAM R. LAIDLAW, JR.

244-250 West 49th Street
NEW YORK

TELEPHONE, 2052 BRYANT

Manufacturer and Importer of

Auto Top Fabrics

"THE RECOGNIZED STANDARD LINE"

"Auto-Leather" for Tops and Cushions
is ALWAYS WATERPROOF

Waterproof Fabrics for Auto Curtains,
Slip Covers and Lap Robes

LARGE VARIETY
OF PATTERNS

Write for Sample Book
My Sample Book is not "stuffed," for effect, with Styles which cannot be delivered promptly.

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For compound steam engines the numb
ring in the low-pressure cylinder, and the
cylinder or cylinders is referred to the area
The power given off at the road wheels

$$p = \frac{HW +}{}$$

and the brake horsepower required at the e

$$HP = \frac{HW +}{7}$$

With the other conditions known, the efficie

$$\xi = \frac{HW +}{HP}$$

the speed of the ascent in miles per hour fro

$$S = \frac{HWL +}{HP}$$

and the time occupied in the ascent from

$$T = \frac{HW + (}{HP.}$$

Unless the probable speed of the car is hi
sure upon the surface of the car presented to
that due to the speed of the car through still a
the foregoing expressions without introducing

SPEED F(

To reduce A miles in B seconds to miles

$$A \times \frac{3600}{B} =$$

SPEED EQUIVALENTS IN AMERICAI

1 mile per hour = 88
= 1.4(
= 27.8
= 0.4(
1 km. per hour = 0.6:
= 54.9
= 0.91

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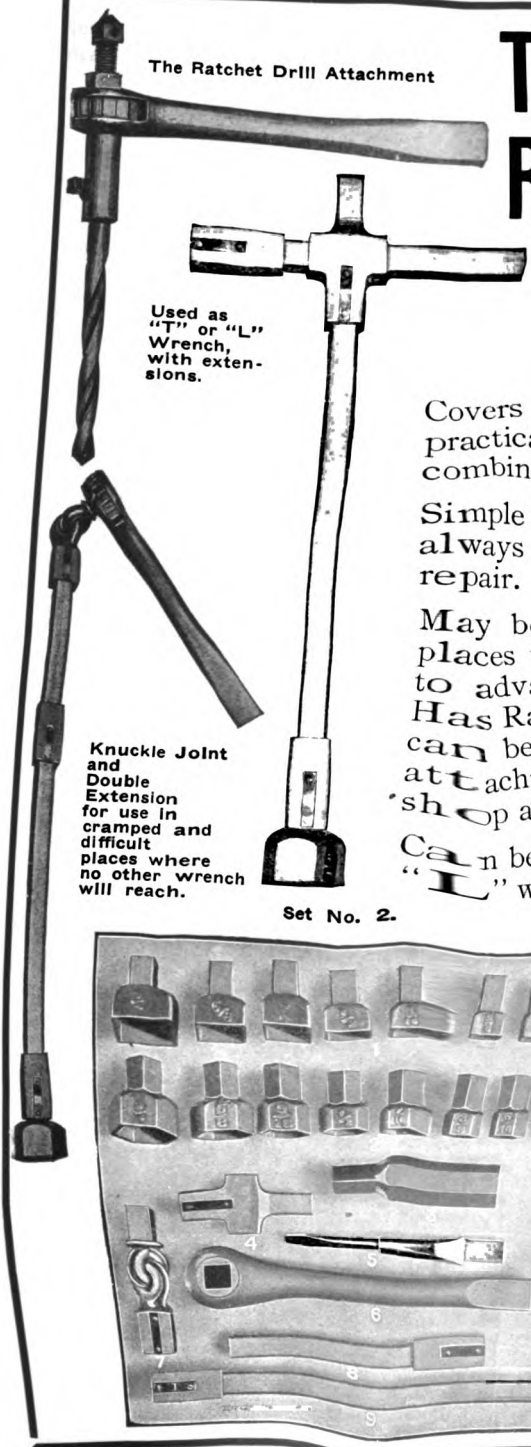

The CHAMPION Ratchet Wrench

The Most Useful Tool Ever Offered to Automobilists

Covers the whole wrench field with a practical Ratchet Drill Attachment combined.

Simple and strong in construction—always ready and never gets out of repair.

May be used in cramped and close places where you are unable to work to advantage with any other wrench. Has Ratchet and Drill Attachment so can be used as drill in emergency; an attachment of special advantage to shop and repair men.

Can be used with extensions as "T" or "L" wrench; knuckle joint and double extension for cramped places where no other wrench can go.

The Greatest Seller ever shown.

Big Money for dealers who write quick.

WRITE US.

THE SYRACUSE WRENCH CO.

FRANKLIN AND WATER STS. SYRACUSE, N.Y.

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RATE OF SPEED IN MILES PER H(MEASURED MILE FROM (

Time Over Measured Mile		Rate of Speed in Miles per Hour	Time Over Measured Mile	
Min.	*Sec.*		*Min.*	*Sec.*
1	0	60.00	1	27
1	1	59.00	1	28
1	2	58.06	1	29
1	3	57.14	1	30
1	4	56.25	1	31
1	5	55.38	1	32
1	6	54.54	1	33
1	7	53.73	1	34
1	8	52.94	1	35
1	9	52.17	1	36
1	10	51.42	1	37
1	11	50.70	1	38
1	12	50.00	1	39
1	13	49.31	1	40
1	14	48.65	1	41
1	15	48.00	1	42
1	16	47.37	1	43
1	17	46.75	1	44
1	18	46.15	1	45
1	19	45.57	1	46
1	20	45.00	1	47
1	21	44.44	1	48
1	22	43.90	1	49
1	23	43.37	1	50
1	24	42.85	1	51
1	25	42.35	1	52
1	26	41.86	1	53

REVOLUTIONS PER MINUTE (DIFFERENT RA

Diameter of Wheel	M			
	2	4	6	8
Inches				
24.....	28	56	84	112
26.....	26	52	78	103
28.....	24	48	72	96
30.....	22	45	67	90
33.....	20	41	61	82
36.....	19	37	56	75
42.....	16	32	48	64

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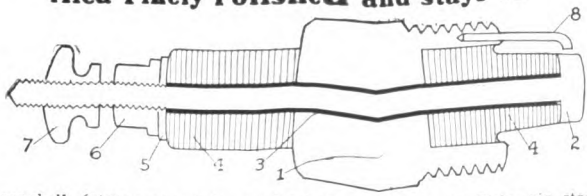
"RICH SPARK" PLUG

MOST PRACTICAL PLUG On the Market

ABSOLUTELY CANNOT BLOW OUT

No Shellac used in any part

Mica Finely Polished and stays so



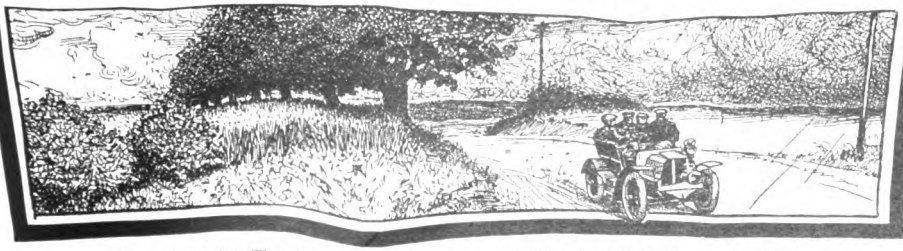
(1) Brass shell (state make of Auto when ordering); (2) Firing pin, steel; (3) Best India sheet mica wrapped around 2 enough turns to give perfect insulation; (4) Best mica disks fit around 3 closely and forced together under great pressure; (5) Copper washer; (6) Brass nut to keep washer in place; (7) Thumb screw for wire or terminal; (8) Spark pin, non-corrosive alloy.

It has double insulation and from its construction it can be seen that pressure from inside the cylinder only tends to make it tighter. Note this plug is partly chambered, and yet the insulation projects out far enough to allow easy cleaning and to get the spark well into the cylinder, thus increasing the power of the engine. No packing is used, therefore none to loosen up or blow out.

PRICE, $1.00, and worth twice the money

Richardson Engineering Co., Hartford, Conn.

Liberal discount to manufacturers and dealers Write us



STRIKING ENERGY OF A

Let W = weight of automobile, measured i
F = average force over the distance req
in pounds.
L = distance over which force is exerted
V = velocity in feet per second,

Then Energy = $\frac{W V^2}{64.4}$ in foot pounds,

$F L$ = measure of destructive worl

Then $F L = \frac{W V^2}{64.4}$

$$F = \frac{W V^2}{64.4 L}$$

$$L = \frac{W V^2}{64.4 F}$$

Or, otherwise and more generally, let E
is lost in overcoming an average resistance F
Then:

$$E = F L$$
$$F = E \div L$$
$$L = E \div F$$

In the actual case of automobile collisi
a distance average of the force developed.
destructive work done as would correspond
L. Actually, the destructive work will be n
sist of a very much larger force, acting thr
for the rupture of the part in question.

TRANSMISSION EFFICIENCY OF I
(WORBY]

Source of Loss of Power
When d iving direct:
One chain.....
One and one-half pairs of bearings.....
With epicylic speed gear in operation, a
When driving direct:
One se of g ar.....
Two pairs of bearings.....
Partially active bearings.....
With change-speed reduction gear in
add.....

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Limousine and Landaulette

TOURING AND RUNABOUT

BODIES

of the highest quality, style and durability. All styles of high grade tops to fit any car. Send specifications and let us quote prices.

Hume Carriage Co.

AMESBURY MASS.

THE "HALL" CARBURETER

POWERFUL DEPENDABLE ECONOMICAL

ALL SIZES

Tested and Proven

Used exclusively by one of the largest manufacturers, making 1200 HIGH GRADE Automobiles per annum.

We also manufacture Auto. and Bi-Wrenches, Bi Chains, Combination Pliers, Foot Power Grinders.

METAL STAMPING

Charles E. Hall Company

No. 108 BROADWAY

BUFFALO, N. Y., U. S. A.

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Source of Loss of Power

One set of gear.....
Three pairs of bearings.....
Equivalent of two chains.....

Two sets of gear.....
Four pairs of bearings.....

Two sets of gear.....
Five pairs of bearings.....
Equivalent of one chain.....

Equivalent of three sets of gear.....
Five pairs of bearings.....

TRACTION EFFORT ON V

On rails or plates.....
Asphalt or hardwood.....
Macadam.....
Loose gravel.....
Sand.....

With different tires (comparatively)
Iron.....
Solid Rubber.....
Pneumatic.....

POWER CONSUMED IN MOVING VELOCITIES IN T

SPEED IN		Horse-power pe Square foot of Effective Surfa
Miles per Hour	Feet per Minute	
10	880	0.013
15	1,320	0.044
20	1,760	0.105
25	2,200	0.205
30	2,640	0.354

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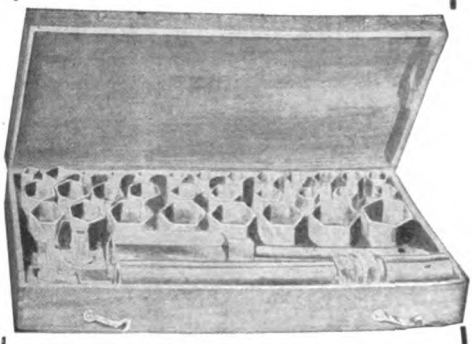
AUTO CLE
Automobile Wrench

Works at any angle, fits every nut and bolt on any car. Everyone should have one.



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We also make the Q & C Stanwood Auto Step. The all steel step that never wears out. Keeps the car clean.

Send in 1908 Specifications Now

Send for catalogs.

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For your own benefit *specify* DURO, and your business, profit and reputation is safely fortifi d.

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CHICAGO
Main Office, 1400 Michigan Ave.

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NEW NEAT NATTY ALL COLORS SIZES

ARTIFICIAL LEATHER 4.00
BLACK ENAMELLED DUCK 3.00
MANUFACTURED ONLY BY
HOPEWELL BROS.
42 OSBORNE ST., CAMBRIDGE, MASS.
IF YOUR DEALER DOES NOT CARRY SEND US P.O. ORDER.

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STRENGTH OF AU1

	M
Aluminum alloys	8 1
Phosphor bronze	12 1
Manganese bronze	
Aluminum bronze	
Wrought iron	
Mild open hearth steel	
Tool steel	
Nickel steel	
Nickel chrome steel	
Vanadium steel treated	

All of the above materials stand well 1
tool steel, which should not be used for t

TEST OF HIGH QUALITY N1

DIMENSIONS OF TEST BARS, 5.91

Elastic limit, pounds per square inch	
Tensile strength, pounds per square inch	
Elongation, per cent	
Contraction, per cent	

Foregoing tests assume correct heat

BALANCE SHEET REPORTED BY
OF CIVIL ENGINEERS OI
OF INTERNAL C

Tests were made on three engines of
spectively, giving 6 I.H.P., 24 I.H.P. an

Exhaust waste	
Jacket waste	
Radiation	
B.H.P	

In obtaining this balance sheet the
jacket waste measured, and the radiati
brake horse power was determined by 1
engines may be assumed as 0.84, 0.85 a

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STITCH-IN-TIME VULCANIZER

This Vulcanizer only weighs 1 1-2 pounds, and can be carried in the tool kit of an automobile. Repairs can be made by the roadside if necessary. Make a patch 3 x 2½". Guaranteed to do all claimed for it or money refunded

Anybody Can Use It.

Blowouts, Sandboils, glass cuts or other damaged spots on out casings; torn off stems, split or punctures to inner tubes vulcanized good as new with our Vulcanizers We want to send you circulars and what others say.

"STITCH-IN-TIME" VULCANIZER CO. Topeka, Kan., U. S. A.

"Keep Your Eye on Continentals!"

Continental TIRES

may cost a little more at the start, but when figuring maintenance and repair cost they invariably prove the most economical in the end.

Continental Caoutchouc Co.

J. M. GILBERT, Gen'l Mgr. 43 Warren Street, New York

REPRESENTATION EVERYWHERE

SAMSON

TYPE COURSE

NON SKIDDING NON PUNCTURABLE

KING OF TIRES
TIRE OF KINGS

SAMSON LEATHER TIRE CO.,
1634-1642 Broadway, New York.
G. de PONTAC, Gen'l Manager.

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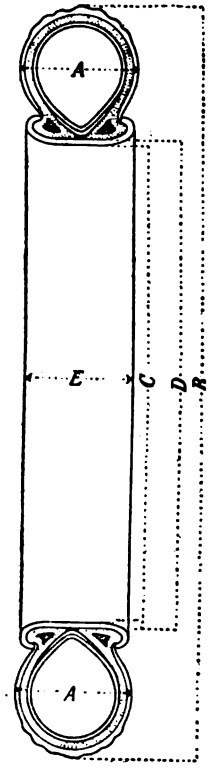
CLINCHER TIRE A



A Inches	I
2 1/2	
3	
2 1/2 and 3	
2 1/2 and 3	
3	
3	
3	
3 1/2	
3 1/2	
3 1/2	
3 1/2	
3 1/2	
4	
4	
4	
4	
4 1/2	
4 1/2	
4 1/2	

METRIC TIRES AND THE

Metric Sizes
650 x 65
700 x 65
750 x 65
800 x 65
830 x 65
860 x 65
700 x 85
750 x 85
800 x 85
860 x 85
760 x 90
810 x 90
840 x 90
870 x 90
910 x 90
960 x 90
1010 x 90
815 x 105

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HARBURG TIRES

Made in Germany

The Harburg settles the question of tire for all who try it. Write us.

Harburg Tire Company

232 West 58th St., *New York*

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NAT'L ELECTRIC SUPPLY CO., 1330 N. Y. Ave., Washington, D. C.

AUTO TRADING & STORAGE CO. 97-101 Central Ave., Albany, N. Y.

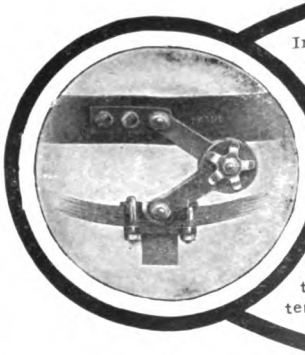
FRANK SHAW, 260 North Broad St., Philadelphia, Pa.

HARRIS RUBBER & SUPPLY CO., Cor. Turk & Polk Sts., San Francisco, Cal

TRUFFAULT-HARTFORD

Shock Absorber

THE PIONEER THE BEST



In automobiling, Truffault-Hartford Shock Absorbers are indispensable. They insure comfortable riding, even for the occupants of the tonneau under the most adverse road conditions. Besides, they prevent the breaking of springs, save time, tires and trouble.

The superiority and individual qualities of the pioneer Shock Absorber are best demonstrated by the fact that the Truffault-Hartford has been adopted exclusively as equipment by such prominent cars as the Pierce Great Arrow, Studebaker, Stevens-Duryea "Big Six," Stoddard-Dayton Six Cyl., Marmon, Continental, Lane, Conover, Sultan and Frontenac.

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Metric Sizes
875 x 105
915 x 105
820 x 120
850 x 120
880 x 120
920 x 120
1020 x 120
1080 x 120

PROPORTIONS BETWEEN A
ADOPTED BY AMER

3 1/2-inch tires, all diameters.....
2- inch tires, all diameters.....
3 1/2 x 28-inch tires.....
3 1/2 x 30-inch tires.....
3 1/2 x 32-inch tires.....
3 1/2 x 34-inch tires.....
3 1/2 x 36-inch tires.....
4 x 30-inch tires.....
4 x 32-inch tires.....
4 x 34-inch tires.....
4 x 36-inch tires.....
4 1/2 x 32-inch tires.....
4 1/2 x 34-inch tires.....
4 1/2 x 36-inch tires.....

For weights in excess o 1,000 pounds
mended. Weights given apply to car withou

AIR PRESSURES FOR INFL
RECOMMENDED BY

Diameter of Tire, Inches	Maximum Wheel
2 1/2	22
3	35
3 1/2	60
4	75
4 1/2	1,00
5	1,00

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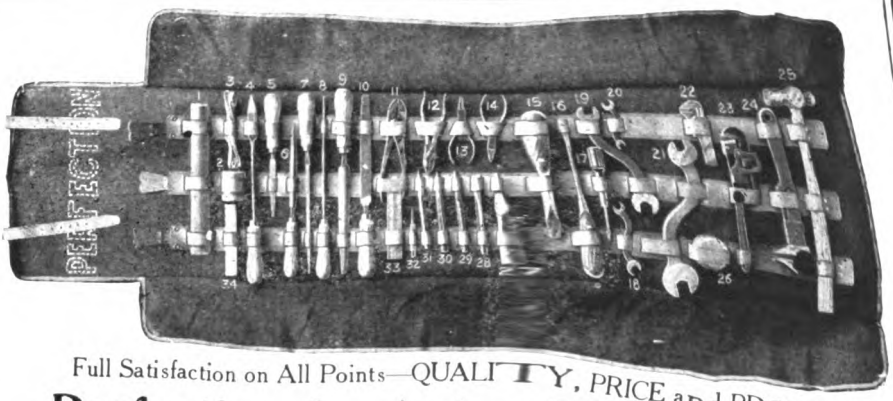

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IMMEDIATE SHIPMENT—SPECIAL KITS TO ORDER

DEALERS! Get Our Proposition Let us help you to help yourself to the excellent trade which is to be obtained from the sale of these really high quality kits which enable you to satisfy every customer and still make good money. WRITE TO-DAY.

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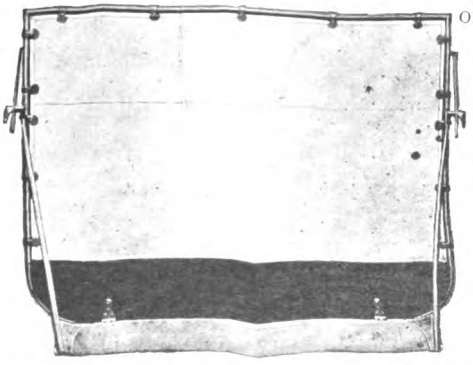

ASSOCIATION OF LICE
STANDARD FOR
A

The present United States
were established by the Un
These standards remained pre
great convenience and value.
of fine machinery have foun
their work the United States
coarse, and the dimensions of
satisfactory construction spec
have had to be made. The
and nuts have finally become
expense have been caused. T
Licensed Automobile Manufac
which is herewith set forth.

It is assumed that where sc
cast-iron, brass, bronze or alu
pitches will be used.

A. L.

This standard is to be know
Manufacturers' Standard for Hex

The term "Screw" is intended
bolt" and "cap-screw."

The term "Plain Hexagon Nut"
"United States Standard Nut."

The term "Castle Nut" is given
where a positive locking system is

The term "Facing" is given to
castle nuts and plain nuts.

The detailed dimensions and sp
nuts, from one-quarter ($\frac{1}{4}''$) inch to

(Continued o

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Hartford Machine Screw Company

Any Turned or Milled Piece used on any automobile is within our line of manufacture

Gear Blanks	Thumb Nuts
Hub Caps	Clutch Parts
Turnbuckles	Turned Washers
Screws	Turned Rivets
Nuts	Transmission Parts
Studs	Crank Sleeves
Cam Rollers	Plugs
Taper Pins	Knobs
Spark Plugs	Posts
Pinions	Yoke Pins
Ball Cups	Collars
Ball Cones	Dowel Pins
Chain Studs	Coupling Bolts
Chain Rolls	Couplings
Binding Posts	Steering Gear Spindles
Valve Stems	

Hartford, Conn., U.S.A.

A. L. A. M. Standard Screws and Nut

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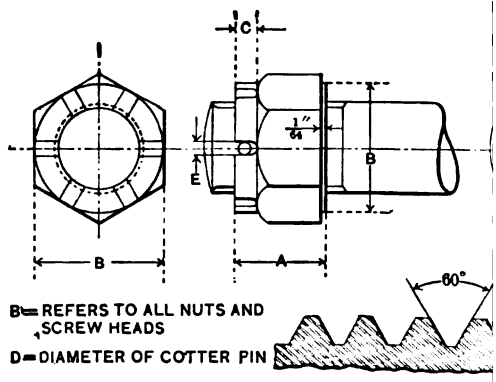
DIMENS



D	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
P	28	24	24	20	20
A	$\frac{9}{32}$	$\frac{21}{64}$	$\frac{13}{32}$	$\frac{29}{64}$	$\frac{9}{16}$
A_1	$\frac{7}{32}$	$\frac{17}{64}$	$\frac{21}{64}$	$\frac{3}{8}$	$\frac{7}{16}$
B	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{11}{16}$	$\frac{3}{4}$
C	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{16}$
E	$\frac{5}{64}$	$\frac{5}{64}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
H	$\frac{3}{16}$	$\frac{15}{64}$	$\frac{9}{32}$	$\frac{21}{64}$	$\frac{3}{8}$
I	$\frac{3}{32}$	$\frac{7}{64}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
K	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$
d	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$

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WE have provided ourselves with
Supply of Special Material, al
Taps and Gauges, and are prepared to furni

Hexagon Head Screws, Nuts, etc.

which we guarantee fully up to the Specifications of the A. L. A. M.

Send us your specification

DETROIT SCREW WORKS
DETROIT, MICH.

Standard Set and Cap Screws, Steel Taper Pins, Coupling Bolts, Nuts, etc.

"ANYTHING TURNED FROM BAR"

HARDENED and GROUND WORK OUR SPECIALTY

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SPECIFICATIO

Material.—A better material than ordin necessary. The selection of a better ma extent upon the possibility of commerciall Such material has been found in several strength of not less than one hundred t square inch, and an elastic limit of sixty square inch, as compared with fifty or si pounds per square inch tensile strength pounds per square inch elastic limit no

The Screws and Nuts described in t better material.

Screws are to be left soft.

Screw Heads are to be left soft.

The Plain Nuts are to be left soft.

The Castle Nuts are to be case-hard

Tolerance.—The body diameter c (.001″) inch less than the nominal and a minus tolerance of two-thous

The nuts shall be a good fit, wit

The clearance between tops of shall be that existing in the prese is, the tap shall be between two sandths (.003″) inch large.

Finish.—Screw heads shall be

Plain nuts shall be flat chamf

Castle nuts shall be chamfere

What is understood by screw for all heads and nuts.

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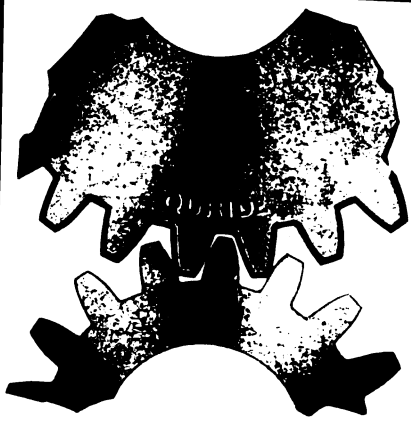

QURIDE
Silent Gear

not raw—but *cured*—hi
(Quride). A filled gear th
will stand up in heat, oil
water where others hav
failed.

A special leather for Mechanical Appliances
Let us tell you more about Quride
We also make all kinds of Metal Gears

PICROME HIDE COMPANY
SYRACUSE, NEW YORK

Many a Good Car Has Been Condemned
Because of a Poor Oiler

Better use the Right Kind, the

HANCOCK OILER

VALVELESS FORCE-FEED

Our little book, "Facts About Oilers," tells all about it.
Write for it today.

HANCOCK MFG. CO., 770 E. Henry St., Charlotte, Mich.

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INTERNATIONAL (METRIC SYSTEM)

Diameter of Screw	Pitch
Millimetres	*Millimetres*
3	·5
4	·75
5	·75
6	1.0
7	1.0
8	1.0
8	1.25
9	1.0
9	1.25
10	1.5
11	1.5
12	1.5
12	1.75
14	2.0
16	2.0
18	2.5
20	2.5
22	2.5
22	3.0
24	3.0
26	3.0
27	3.0
28	3.0
30	3.5
32	3.5
33	3.5
34	3.5
36	4.0
38	4.0
39	4.0
40	4.0
42	4.5
44	4.5
45	4.5
46	4.5
48	5.0
50	5.0
52	5.0
56	5.5
60	5.5
64	6.0
68	6.0
72	6.5
76	6.5
80	7.0

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) STANDARD 60° THREAD

Diameter at Root of Thread	Width at Top of Thread
M... ...metres	Millimetres
2 35	.06
3 03	.09
4 03	.09
4 70	.13
5 70	.13
6 70	.13
6 38	.16
7 70	.13
7 38	.16
8 05	.16
9 05	.16
10 05	.19
9 73	.22
11 40	.25
13 40	.25
14 75	.31
16 75	.31
18 75	.31
18 10	.38
20.10	.38
22.10	.38
23.10	.38
24.10	.38
25.45	.44
27.45	.44
28.45	.44
29.45	.44
30.80	.5
32.80	.5
33.80	.5
34.80	.5
36.15	.56
38.15	.56
39.15	.56
40.15	.56
41.51	.63
43.51	.63
45.51	.63
48.86	.69
52.86	.69
56.21	.75
60.21	.75
63.56	.81
67.56	.81
70.91	.88

GILBERT Automobile Fabric Supplie

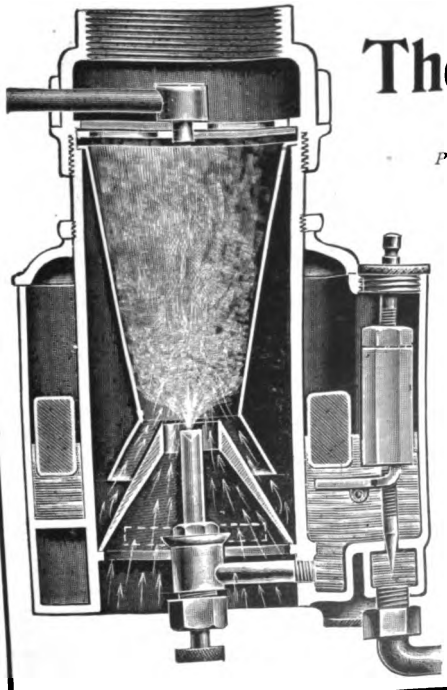
THE ONLY ONES WORTH YOUR MONEY

OUR LINE:

Tire Cases, Tube Cases, Tire Sleeves,
Knuckle Boots, Leggings,
Crank Holders, Ponchos, Co
Cape Top Boots, Spare Tire Holders,
Tool Rolls, Tool Kits, Plug Cases,
Sleeve Protectors, Storm Apr
Lamp Covers, Racing Helmets, Tire Loc

Send for Catalog.
Sold by leading firms everywhere.

The GILBERT MFG. CO., New Haven, Con



The Bowers Carburetor

Patented

This instrument produces the **MAXIMUM EFF CIENCY** from internal combustion motors.

Increasing the **POWER, SPEED,** and flexibilit on a Minimum fuel consumption.

It functions on correct scientific principles and greatly superior in its method of gas formation workmanship and finish, to any carburetor eve brought out.

Our modern new factory allows us to make promp deliveries. We will be pleased to forward sampl instruments to manufacturers who are interested for this season's and next's requirements, and believe you can hardly overlook this opportunity of increasing the popularity of your cars, by securing absolute perfection in carburetion.

Owners of cars, who have ideas of larger motors are advised to try a Bowers' Carburetor first; i makes giants of the weaklings.

Catalogue for the asking.

The F. E. BOWERS CO

NEW HAVEN, CONN.

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UNITED STATES STANDARD 60°

Diameter of Screw	Threads per Inch	Diame of
1/4	20	
5/16	18	
3/8	16	
7/16	14	
1/2	13	
9/16	12	
5/8	11	
3/4	10	
7/8	9	
1	8	
1 1/8	7	
1 1/4	7	
1 3/8	6	
1 1/2	6	
1 5/8	5 1/2	
1 3/4	5	
1 7/8	5	
2	4 1/2	
2 1/4	4 1/2	
2 1/2	4	
2 3/4	4	
3	3 1/2	
3 1/4	3 1/2	
3 1/2	3 1/4	
3 3/4	3	
4	3	
4 1/4	2 7/8	
4 1/2	2 3/4	
4 3/4	2 5/8	
5	2 1/2	
5 1/4	2 1/2	
5 1/2	2 3/8	
5 3/4	2 3/8	
6	2 1/4	

STANDARD PROPORTION

The report of the committee on standard p Society of Mechanical Engineers is published The report is substantially in agreement wi meeting held in New York, April 11, 1904.

The committee believes the following cc and maintaining a standard for the diameters, as it does, diameters, threads and limits fo therewith: (*a*) form of thread, (*b*) diameter reference thread gauges, basic and for screw and taps, (*f*) limits of variation, measured in external diameter, (*h*) limits of variation proportions of the heads.

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SCREW THREADS

eter at Root Thread	Width of Flat and Bottom
.155	[illegible]
.2403	[illegible]
.2930	[illegible]
.3447	[illegible]
.4001	[illegible]
.4542	[illegible]
.5069	[illegible]
.6201	[illegible]
.7307	.0159
.8376	.0159
.9304	.0179
.0044	.0179
.1585	.0203
.2535	.0208
.3888	.0227
.4902	.0256
.6152	.0259
.7113	.0278
.9613	.0278
.1752	.0313
.4252	.0313
.6288	.0357
.8788	.0357
.1003	.0385
.3170	.0417
.5670	.0417
.7982	.0435
.9276	.0455
.1551	.0476
.4804	.0500
.7304	.0500
.9530	.0526
.2030	.0526
.4526	.0556

HINE SCREWS.

r machine screws of the Ameri
r, 1906, proceedings of the Socie
mendations adopted at the

s to be essential in establishing
eads of machine screws, including
ich are to be used in commerce
of threads per inch, (*d*) standard
) working gauges for screws
the thread, (*g*) limits of variation
he thread, screws and taps, (*i*

IN ADVANCE

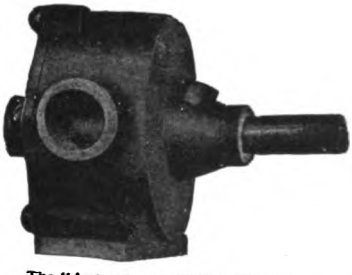
OF THE TIMES

are **"AUTO-POWER"** parts. They **eliminate** the sources of trouble
mon in Automobiles—are **scientifically designed** and **constructed** of t
materials. They **reduce** the cost of installation and **minimize** mainte

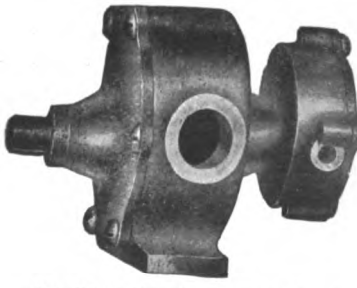
The "Auto-Power" Muffler, an absolute silencer of the exhaust. No Back Pressure.

The "Auto-Power" Timer and Distrib Intensifies Spark and Operates Multip Cylinder Engines with a Single Coil

Satisfied users have proven the claims made for "AUTO-POWER" pa



The "Auto-Power" Single Pump Never Leaks. Durable Construction.



The "Auto-Power" Self Packing Combined Oil and Water Pump.

NOTICE: We solicit the opportunity of sending any of our parts on 30 days' trial to reliable manufacturers.

The Auto & Power Appliance Co.

Offices: The Arcade Bldg. Cleveland, Ohio

SEASON 1907

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PROPERTIES OF GASOLINE AND
(MUNTZ)

Properties	
Carbon	84
Hydrogen	15
Oxygen	...
Density at 15° C	.
Boiling point	
Calories per Kg	
Weight evaporated per hour per dm.² (15.5 sq. in.) of surface:	
1. In experiment room; 18° C	9
2. Outside in the sun; 25° C	47

* 1,302 British heat units per lb. ‡ 752 Bri

TESTS WITH BRITI
GASOLINE AND
Six-Cylinder N

	Specific Gravity	Temp of T Ro F
Ordinary gasoline	.687	6
" "	.699	6
" "	.713	6
" "	.714	6
" "	.759	6
Benzol	.873	

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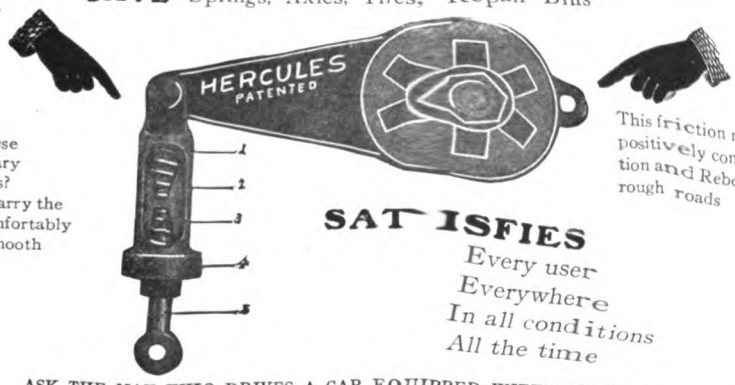
HERCULES SHOCK ABSORBERS

ON YOUR CAR

INCREASE Safety, Comfort, Speed
REDUCE Vibrations, Rebounding and Shocks
SAVE Springs, Axles, Tires, Repair Bills



See these Auxiliary Springs? They carry the car comfortably over smooth roads.

This friction resis positively control tion and Rebound rough roads

SAT ISFIES
Every user
Everywhere
In all conditions
All the time

ASK THE MAN WHO DRIVES A CAR EQUIPPED WITH HERCULES

Hercules Auto Specialty Manufacturing Co

CHICAGO: 115 Dearborn St. LOS ANGELES, CAL.: 936 Denver Ave

Sales Agents: NATIONAL SALES CORPORATION, NEW YORK, CHICAGO

Prest-O-Lite TANKS for LIGHTIN and Tire Inflati

Nothing is easier for making money than the facilities we offer to agents who handle "PREST-O-LITE" TANKS.

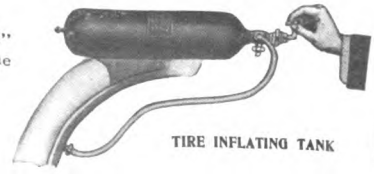
Every customer who comes into your shop is interested in the question.

PREST-O-LITE TANKS SOLVE THE PROBLEM COMPLETELY.

With the name and reputation behind "PREST-O-LITE" TANKS, it is one of the easiest things to supply the demand already created.

TO OFFER THEM IS TO SELL THEM.

Write TO-DAY for particulars.



TIRE INFLATING TANK

THE PREST-O-LITE CO.

1904 Broadway. NEW YORK.

MAIN STATIONS } NEW YORK, 1904 Broadway. BOSTON, 541 Tremont. SAN FRANCISCO, Point Richmond INDIANAPOLIS, 22-24 S. East Street TORONTO, 6 King Street, W.
Or at Any Responsible Dealers or Garage

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SPECIFIC GRAVITIES CORRI
SCALE AT 60

Baumé Degrees	Specific Gravity
63	0.728
64	0.724
65	0.720
66	0.717
67	0.713
68	0.709
69	0.706
70	0.702
71	0.699

REVERSIBLE CHEMICAL EQ
WHICH TAKE PLACE I
BATTERY (L.

CH

(a) $PbO_2 + H_2SO_4 = PbSO_4 +$

(b) $Pb + H_2SO_4 = PbSO_4 + H$

(c) $c = (a) + (b) = PbO_2 + P$

DIS

Equation (a) expresses the reactions
and (c) the combined effect is the funda

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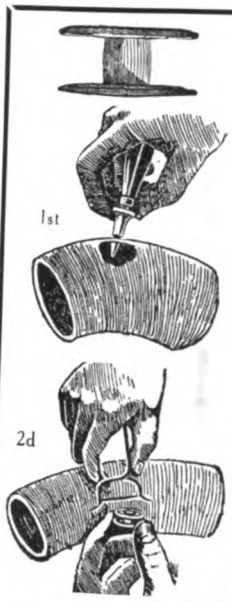
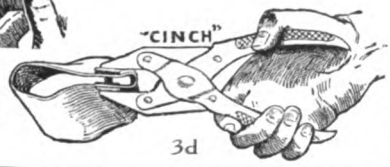
A "CINCH" FOR BIG PROFITS
WITH THE QUICK SELLING
"CINCH" TIRE REPAIR K



EVERY AUTOIST WANTS IT
Because it Repairs a Puncture in ONE Min
and **REPAIRS IT PERMANENTLY**
NO CEMENT—NO VULCANIZING—NO WAITING
SAVES TIME — MONEY — TEMPER
The secret lies in the Collapsible Metal Seal, Rubber Coated, whi
is so easily and quickly handled.

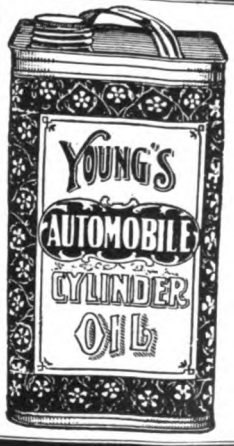
WE WANT DEALERS EVERYWHERE AND
MAKE LIBERAL DISCOUNTS TO GET THEM

Auto Goods Co.
65 State St., Boston Mass.



Write for Proposition

YOUNG'S OILS and GREASES for Automobiles



Oils and Greases of Established Reputation and Quality and that Offer Great Money-Making and Business-Bringing Opportunities to Dealers

For more than thirty years **YOUNG'S OILS AND GREASES** has been the standard for highest grade. Their use has principally been confined to high-class machine and engine rooms, but the demand for high grade oils to meet the exacting requirements of automobile lubrication has turned our goods into this channel, and they have met, everywhere, with the most pronounced success. **This is due solely to their quality.**

If you are a dealer, we will make you a proposition you cannot well afford to ignore if you have your own interest at heart. It's an offer that means a greater income and a wider reputation to you. Write to us to-day and inquire about it.

Write To-day

ORLANDO W. YOUNG
NO. 180 FRELINGHUYSEN AVE. NEWARK, N.J.

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FORMULAS FOR CONVERSION OF

To convert degrees, Centigrade or Réaumur, i

Let F = No. of degrees Fahrenheit.
C = " " " Centigrade.
R = " " " Réaumur.

$$F = \frac{9C}{5} + 32;$$

$$C = \frac{5(F - 32)}{9}$$

Freezing point, or 32° Fah. = zero in Cent.
Boiling point, or 212° Fah. = 100° Cent., o

FRENCH AND AMERICAN E

MEASURES OI

French

1 meter.....
.3048 meter.....
1 centimeter.....
2.54 centimeters.....
1 millimeter.....
25.4 millimeters.....
1 kilometer.....

MEASURES (

1 gramme.....
.0648 gramme.....
28.35 grammes.....
1 kilogramme.....
4536 kilogramme.....

1 tonne or metric ton.....

1000 kilogrammes.....

MEASURES

1 liter (1 cubic decimeter).....

28.317 liters.....
4.543 liters.....
3.785 liters.....

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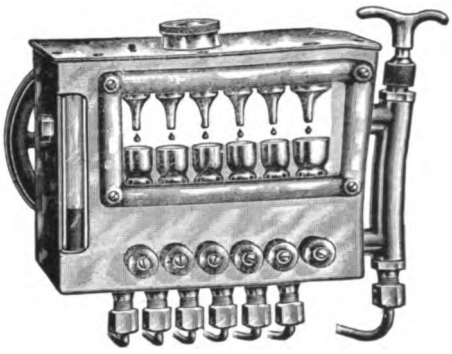
POSITIVE LUBRICATION



CHARLES W. MANZEL, Patentee

The Standard Automatic Force Feed Lubricator

We make anything you want in a Mechanical Oiler, that will excel anything of its kind on the market.

Sent on approval to Auto and Motor Boat Manufacturers.

WRITE FOR BOOK.

STANDARD AUTOMATIC LUBRICATOR CO.

361-363 ELLICOTT STREET, BUFFALO, N. Y.

THE VERY LAST DROP IS AS GOOD AS THE FIRST!

"Panhard" Oil

NEVER varies. It is scientifically compounded and accurately prepared. It is recognized throughout the automobile and motor boat trade as the STANDARD oil for use in the cylinders.

It develops and maintains the highest efficiency of the engine. Don't cripple the motive power of your car by using some cheap oil. This is false economy. Demand "PANHARD"—the oil that will not char.

Geo. A. Haws, 80 Pine Street, N. Y.

The oil in the checkerboard can is a cylinder necessity

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TABLE OF DECIMAL EQUIV
OF AN INCH

	1/64	.0156		17/64	.26
	1/32	.0312		9/32	.28
	3/64	.0468		19/64	.29
1/16		.0625	5/16		.31
	5/64	.0781		21/64	.32
	3/32	.0937		11/32	.34
	7/64	.1093		23/64	.35
1/8		.125	3/8		.37
	9/64	.1406		25/64	.39
	5/32	.1562		13/32	.40
	11/64	.1718		27/64	.42
3/16		.1875	7/16		.43
	13/64	.2031		29/64	.45
	7/32	.2187		15/32	.46
	15/64	.2343		31/64	.48
1/4		.25	1/2		.5

TABLE OF APPROXIMATE C

1	2	3	4	5	6
5 x 12	6x18	6x24	6x36	6x42	
	7x12	7x18	7x24	7x30	7x3
		8x15	8x18	8x24	8x3
		9x12	9x15	9x18	9x2
					10x2

10	15	20	25	30
8x48				
9x40				
10x32	10x48			
12x24	12x34	12x42	12x50	12x60
14x18	14x24	14x30	14x38	14x44
	16x18	16x24	16x30	16x36

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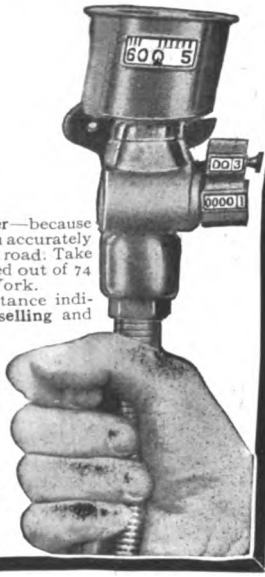
WHY WE MAINTAIN PRICES—
And All About The Glidden Tour

Victory for The Warner Auto-Meter



We, the makers, and every dealer can maintain prices for the **Auto-Meter**—because the owners of the Cream of all Cars demand this **topnotcher** instrument, which accurately tells **"How Fast"** and **"How Far"** under all most trying conditions of service on road. Take the **Glidden Tour,** for example. At the **start** there were 55 **Auto-Meters** installed out of 74 entrants. At the **finish** 36 **Auto-Meters** were on 48 cars that reached New York.

You can sell more **Auto-Meters** at **better profits** than other speed and distance indicators will bring you, because of the **greater demand** for, and **practical selling** and **using** points of the **Auto-Meter.**

You know—and everybody knows—that the **Auto-Meter** is the most popular speed and distance instrument with either experienced or amateur motorists.

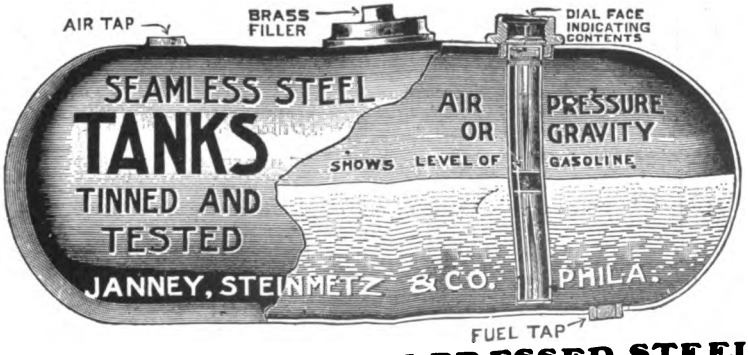
We don't ask dealers to stand back of each **Auto-Meter** they sell. We **Absolutely Guarantee** each **Auto-Meter to the dealer** and **to the user** and never hesitate a moment to refund the price paid or replace any Auto-Meter that for any **possible** reason does not give **absolute satisfaction.**

WRITE FOR TERMS TO DEALERS

Warner Instrument Company
723 Roosevelt St. Beloit, Wis.

Seamless Steel Tanks
TINNED AND TESTED

LEAKLESS



RIVETLESS

SPECIAL SHAPES IN PRESSED STEEL
Tanks all sizes from 1 gallon to 100 gallons
FOR AIR PRESSURE OR GASOLINE
NEW CATALOGUE NOW READY

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Reference Table Showing Equivalen per Hour for Elapsed Time O Measured Kilometer fron ively by 1-5 Second

Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilo-metres per hour.	Time of one Kilo-metre. m. s.	Equal to Kilo-metres per hour.	Equal to miles per hour.	1 m
24	150.00	241.54	24	150.00	93.15	
1/5	148.76	239.55	1/5	148.76	92.38	
2/5	147 54	237.58	2/5	147.54	91.62	
3/5	146.34	235.65	3/5	146.34	90.87	
4/5	145.16	233.75	4/5	145.16	90.14	
25	144.00	231.88	25	144.00	89.42	
1/5	142.86	230.05	1/5	142.86	88.71	
2/5	141.73	228.23	2/5	141.73	88.01	
3/5	140.62	226.44	3/5	140.62	87.32	
4/5	139.53	224.67	4/5	139.53	86.64	
26	138.46	222.96	26	138.46	85.98	
1/5	137.40	221.25	1/5	137.40	85.32	
2/5	136.36	219.58	2/5	136.36	84.68	
3/5	135.34	217.94	3/5	135.34	84.04	
4/5	134.33	216.31	4/5	134.33	83.42	
27	133.33	214.70	27	133.33	82.80	
1/5	132.35	213.12	1/5	132.35	82.19	
2/5	131.38	211.56	2/5	131.38	81.58	
3/5	130.43	210.03	3/5	130.43	80.10	
4/5	129.50	208.53	4/5	129.50	80.42	
28	128.57	207.03	28	128.57	79.84	
1/5	127.66	205.57	1/5	127.66	79.27	
2/5	126.76	204.12	2/5	126.76	78.71	
3/5	125.87	202.69	3/5	125.87	78.16	
4/5	125.00	201.29	4/5	125.00	77.62	
29	124.13	199.88	29	124.13	77.08	4
1/5	123.28	198.52	1/5	123.28	76.55	
2/5	122.45	197.18	2/5	122.45	76.04	
3/5	121.62	195.84	3/5	121.62	75.52	
4/5	120.80	194.52	4/5	120.80	75.01	
30	120.00	193.23	30	120.00	74.52	4
1/5	119.20	191.95	1/5	119.20	74.02	
2/5	118.42	190.69	2/5	118.42	73.52	
3/5	117.64	189.43	3/5	117.64	73.05	
4/5	116.88	188.21	4/5	116.88	72.58	
31	116.13	187.00	31	116.13	72.11	42
1/5	115.38	185.79	1/5	115.38	71.65	
2/5	114.65	184.62	2/5	114.65	71.20	
3/5	113.90	183.41	3/5	113 90	70.73	
4/5	113.21	182.28	4/5	113.21	70.30	
32	112.50	181.16	32	112.50	69.86	43
1/5	111.80	180.03	1/5	111.80	69.43	
2/5	111.11	178.92	2/5	111.11	69.00	
3/5	110.43	177.82	3/5	110.43	68.57	
4/5	109.75	176.73	4/5	109.75	68.15	
33	109.09	175.67	33	109.09	67.74	44
1/5	108.43	174.60	1/5	108.43	67.33	1
2/5	107.78	173.56	2/5	107.78	66.93	2
3/5	107.14	172.53	3/5	107.14	66.53	3
4/5	106.51	171.51	4/5	106.51	66.14	4
34	105.88	170.50	34	105.88	65.75	45
1/5	105.26	169.50	1/5	105.26	65.36	1
2/5	104.65	168.52	2/5	104.65	64.98	2
3/5	104.04	167.53	3/5	104.04	64.61	3
4/5	103.45	166.58	4/5	103.45	64.24	4

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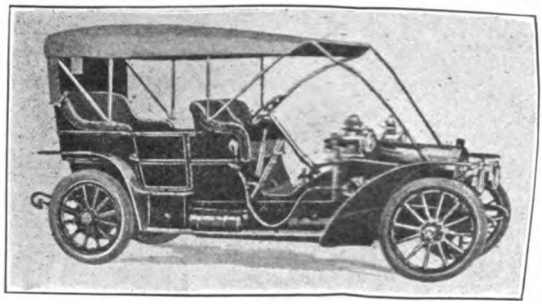

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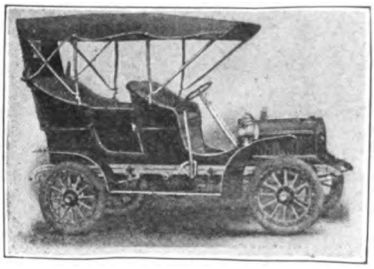

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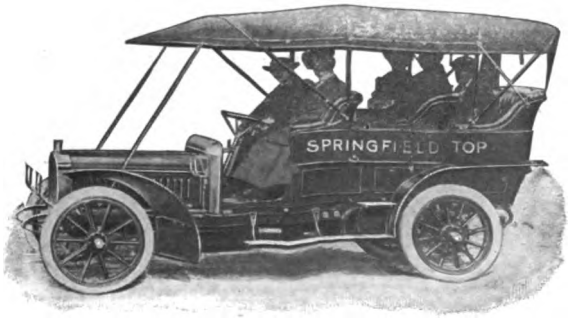

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Time for One Mile. m. s.	Equal to miles per hour.	Equal to Kilometres per hour.	Time of one Kilometre. m. s.	Equal to Kilometres per hour.	Equal to miles per hour.	Time for One Mile. m. s.
46	78.26	126 02	46	78.26	48.60	53
1/5	77.92	125.47	1/5	77.92	48.39	1/5
2/5	77.58	124.92	2/5	77.58	48.17	2/5
3/5	77.25	124.39	3/5	77.25	47.97	3/5
4/5	76.92	123.86	4/5	76.92	47.76	4/5
47	76.59	123.34	47	76.59	47.56	54
1/5	76.27	122.81	1/5	76.27	47.36	1/5
2/5	75.95	122.30	2/5	75.95	47.16	2/5
3/5	75.63	121.78	3/5	75.63	46.96	3/5
4/5	75.31	121.27	4/5	75.31	46.76	4/5
48	75.00	120.77	48	75.00	46.57	55
1/5	74.68	120.25	1/5	74.68	46.37	1/5
2/5	74.38	119.77	2/5	74.38	46.19	2/5
3/5	74.07	119.27	3/5	74.07	46.00	3/5
4/5	73.77	118.79	4/5	73.77	45.81	4/5
49	73.47	118.30	49	73.47	45.62	56
1/5	73.17	117.82	1/5	73.17	45.44	1/5
2/5	72.87	117.34	2/5	72.87	45.25	2/5
3/5	72.58	116.87	3/5	72.58	45.07	3/5
4/5	72.29	116.40	4/5	72.29	44.89	4/5
50	72.00	115.94	50	72.00	44.71	57
1/5	71.71	115.47	1/5	71.71	44.53	1/5
2/5	71.42	115.00	2/5	71.42	44.35	2/5
3/5	71.14	114.55	3/5	71.14	44.18	3/5
4/5	70.86	114.10	4/5	70.86	44.00	4/5
51	70.58	113.67	51	70.58	43.83	58
1/5	70.31	113.22	1/5	70.31	43.66	1/5
2/5	70.04	112.78	2/5	70.04	43.49	2/5
3/5	69.76	112.33	3/5	69.76	43.32	3/5
4/5	69.49	111.90	4/5	69.49	43.15	4/5
52	69.23	111.48	52	69.23	42.99	59
1/5	68.96	111.04	1/5	68.96	42.82	1/5
2/5	68.70	110.62	2/5	68.70	42.66	2/5
3/5	68.44	110.21	3/5	68.44	42.50	3/5
4/5	68.18	109.79	4/5	68.18	42.34	4/5

(CONTINUED ON PAGE

Steel Balls. "Standard" Siz

Size	Decimal	No. per Pound
1/16"	.0625	27,904
3/32"	.0937	8,264
1/8"	.1250	3,400
5/32"	.1563	1,770
3/16"	.1875	1,030
7/32"	.2188	640
1/4"	.2500	430
9/32"	.2613	300
5/16"	.3125	220
11/32"	.2438	165
3/8"	.3750	125
7/16"	.4375	80
1/2"	.5000	52
9/16"	.5625	36
5/8"	.6250	28
11/16"	.6875	21
3/4"	.7500	16

S
13/
7/
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1"
1 1/
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1 3/
1 1/
1 5/
1 3/
1 7/
2"
2 1
2 1
2 3
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3 1
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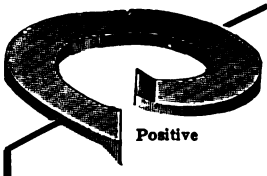

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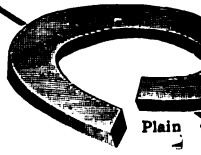

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Reference Table Showing Equivalent Speed in Miles an Time Over the Measured Mile or Measured Kilomet

Time for One Mile m.	s.	Equal to miles per hour.	Equal to Kilometres per hour.	Time of one Kilometre. m.	s.	Equal to Kilometres per hour.	Equal to miles per hour.	Time for One Mile. m.	s.
1	0	60 00	96.61	1	0	60.00	37.26	2	12
1	1	59.00	95.00	1	1	59.00	36.64	2	15
1	2	58.06	93.49	1	2	58.06	36.05	2	18
1	3	57.14	92.01	1	3	57.14	35.48	2	21
1	4	56.25	90.58	1	4	56.25	34.93	2	24
1	5	55.38	89.17	1	5	55 38	34.39	2	27
1	6	54.54	87.82	1	6	54.54	33.87	2	30
1	7	53.73	86.52	1	7	53.73	33.36	2	33
1	8	52.94	85.25	1	8	52.94	32.87	2	36
1	9	52.17	84.01	1	9	52.17	32.40	2	39
1	10	51.42	82.80	1	10	51.42	31.93	2	42
1	11	50.70	81.64	1	11	50.70	31.48	2	45
1	12	50.00	80.51	1	12	50.00	31.05	2	48
1	13	49.31	79.40	1	13	49.31	30.62	2	51
1	14	48.65	78.34	1	14	48.65	30.21	2	54
1	15	48.00	77.29	1	15	48.00	29.81	2	57
1	16	47.37	76.28	1	16	47.37	29.41	3	0
1	17	46.75	75.28	1	17	46.75	29.03	3	6
1	18	46.15	74.31	1	18	46.15	28.66	3	12
1	19	45.57	73.38	1	19	45.57	28.30	3	18
1	20	45.00	72.46	1	20	45.00	27.04	3	24
1	21	44.44	71.56	1	21	44.44	27.60	3	30
1	22	43.90	70.69	1	22	43.90	27.26	3	36
1	23	43.37	69.84	1	23	43.37	26.93	3	42
1	24	42.85	69.00	1	24	42.85	26.61	3	48
1	25	42.35	68.19	1	25	42.35	26 30	3	54
1	26	41.86	67.40	1	26	41.86	26.00	4	0
1	27	41.38	66.63	1	27	41.38	25.7	4	6
1	28	40.91	65.87	1	28	40.91	25.40	4	12
1	29	40 45	65.13	1	29	40.45	25.10	4	18
1	30	40.00	64.41	1	30	40.00	24.84	4	24
1	31	39.56	63.70	1	31	39.56	24.56	4	30
1	32	39.13	63.01	1	32	39.13	24.30	4	36
1	33	38.71	62.33	1	33	38.71	24.04	4	42
1	34	38.29	61.66	1	34	38.29	23.77	4	48
1	35	37.89	61.01	1	35	37.89	23.53	4	54
1	36	37.50	60.38	1	36	37.50	23.28	5	0
1	37	37.11	59.76	1	37	37.11	23.04	5	12
1	38	36.73	59.14	1	38	36.73	22.81	5	24
1	39	36.36	58.55	1	39	36.36	22.58	5	36
1	40	36.00	57.97	1	40	36.00	22.35	5	48
1	41	35.64	57.39	1	41	35.64	22.13	6	0
1	42	35.29	56.82	1	42	35.29	21.91	6	15
1	43	34.95	56.28	1	43	34.95	21.70	6	30
1	44	34.61	55.73	1	44	34.61	21.50	6	45
1	45	34.28	55.20	1	45	34.28	21.28	7	0
1	46	33.96	54.68	1	46	33.96	21.09	7	15
1	47	33.64	54.17	1	47	33.64	20.89	7	30
1	48	33.33	53.67	1	48	33.33	20.70	7	45
1	49	33.03	53.19	1	49	33.03	20.51	8	0
1	50	32.72	52.69	1	50	32.72	20.32	8	30
1	51	32.43	52.22	1	51	32.43	20.14	9	0
1	52	32.14	51.75	1	52	32.14	19.96	9	30
1	53	31.86	51.30	1	53	31.86	19.78	10	0
1	54	31.58	50.85	1	54	31 58	19.61	10	30
1	55	31.30	50.40	1	55	31.30	19.43	11	0
1	56	31.03	49.96	1	56	31.03	19.27	11	30
1	57	30.77	49.55	1	57	30.77	19.11	12	0
1	58	30 50	49.11	1	58	30.50	18.94	13	0
1	59	30.25	48.71	1	59	30.25	18.78	14	0
2	0	30.00	48.30	2	0	30.00	18.63	15	0
2	3	29 26	47.11	2	3	29.26	18.17	20	0
2	6	28 57	46.00	2	6	28.57	17.74	30	0
2	9	27 90	44.92	2	9	27.90	17.32		

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Seconds	1 Minute	Equivalent in Miles	2 Minutes	Equivalent in Miles	3 Minutes	Equivalent in Miles	4 Minutes	Equivalent in Miles
0	60.00	69.06	30.00	34.54	20.00	23.03	15.00	17.27
1	59.01	67.95	29.75	34.25	19.89	22.90	14.93	17.20
2	58.06	66.86	29.50	33.97	19.78	22.88	14.87	17.12
3	57.14	65.80	29.26	33.70	19.67	22.65	14.81	17.05
4	56.25	64.77	29.03	33.43	19.56	22.52	14.75	16.98
5	55.38	63.77	28.80	33.16	19.45	22.40	14.69	16.92
6	54.54	62.80	28.57	32.89	19.35	22.28	14.63	16.85
7	53.73	61.87	28.34	32.64	19.25	22.16	14.57	16.78
8	52.94	60.96	28.12	32.38	19.14	22.05	14.51	16.71
9	52.17	60.07	27.90	32.13	19.04	21.93	14.45	16.64
10	51.42	59.21	27.69	31.88	18.94	21.81	14.40	16.5
11	50.70	58.38	27.48	31.64	18.84	21.70	14.34	16.5
12	50.00	57.57	27.27	31.40	18.75	21.59	14.28	16.
13	49.31	56.78	27.06	31.16	18.65	21.47	14.22	16.
14	48.64	56.01	26.86	30.83	18.55	21.36	14.17	16.
15	48.00	55.27	26.66	30.70	18.46	21.25	14.11	16
16	47.36	54.54	26.47	30.48	18.36	21.14	14.06	16
17	46.75	53.83	26.27	30.25	18.27	21.04	14.00	16
18	46.15	53.14	26.08	30.03	18.18	20.93	13.95	1
19	45.57	52.47	25.89	29.82	18.09	20.83	13.90	1
20	45.00	51.81	25.71	29.40	18.00	20.72	13.84	1
21	44.44	51.17	25.53	29.39	17.91	20.62	13.79	1
22	43.90	50.55	25.35	29.17	17.82	20.52	13.74	
23	43.37	49.94	25.17	28.98	17.73	20.42	13.68	
24	42.85	49.34	25.00	28.78	17.64	20.32	13.63	
25	42.35	48.76	24.82	28.58	17.56	20.22	13.58	
26	41.86	48.20	24.65	28.39	17.47	20.12	13.53	
27	41.37	47.64	24.49	28.20	17.39	20.02	13.48	
28	40.90	47.10	24.32	28.00	17.30	19.93	13.43	
29	40.45	46.57	24.16	27.82	17.22	19.83	13.38	
30	40.00	46.06	24.00	27.63	17.14	19.74	13.3	
31	39.56	45.55	23.84	27.45	17.06	19.64	13.2	
32	39.13	45.05	23.68	27.27	16.98	19.54	13.2	
33	38.71	44.57	23.52	27.09	16.90	19.46	13.	
34	38.29	44.10	23.37	26.91	16.82	19.37	13.	
35	37.89	43.63	23.22	26.74	16.74	19.28	13.	
36	37.50	43.18	23.07	26.57	16.66	19.19	13	
37	37.11	42.73	22.93	26.40	16.59	19.10	12	
38	36.73	42.30	22.78	26.23	16.51	19.01	12	
39	36.36	41.87	22.64	26.07	16.43	18.92	1	
40	36.00	41.45	22.50	25.90	16.36	18.84	1	
41	35.64	41.04	22.36	25.74	16.29	18.75	1	
42	35.29	40.64	22.22	25.58	16.21	18.67	1	
43	34.95	40.24	22.08	25.43	16.14	18.58	1	
44	34.61	39.85	21.95	25.27	16.07	18.50		
45	34.28	39.48	21.81	25.12	16.00	18.42		
46	33.96	39.10	21.68	24.97	15.92	18.34		
47	33.64	38.74	21.55	24.82	15.85	18.26		
48	33.33	38.38	21.42	24.67	15.78	18.18		
49	33.02	38.03	21.30	24.52	15.72	18.10		
50	32.72	37.68	21.17	24.38	15.65	18.0		
51	32.43	37.34	21.05	24.24	15.58	17.9		
52	32.14	37.01	20.93	24.10	15.51	17.8		
53	31.85	36.68	20.80	23.96	15.45	17.7		
54	31.57	36.36	20.69	23.82	15.38	17.7		
55	31.30	36.08	20.57	23.68	15.31	17.		
56	31.03	35.73	20.45	23.55	15.25	17.		
57	30.76	35.43	20.33	23.42	15.19	17.		
58	30.50	35.12	20.22	23.28	15.12	17		
59	30.25	34.83	20.11	23.16	15.06	17		

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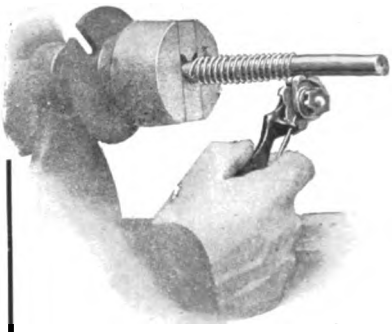

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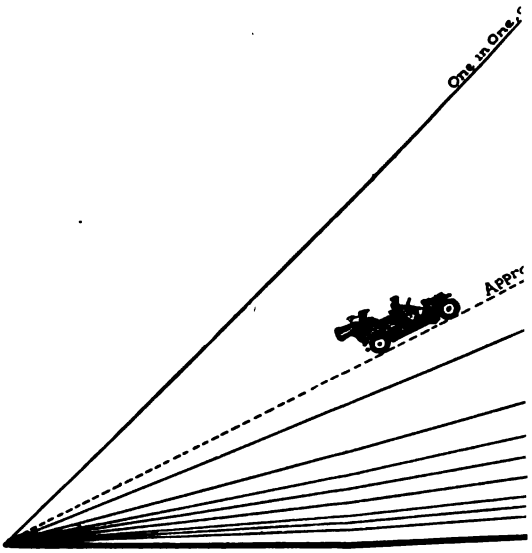

ILLUSTRATING METHOD OF CALCULA

If it be assumed that the base of the t long and that the first sloping line represen it 125 feet above the starting point, this is or 12½ per cent. In other words, one foc the latter instance does not mean distar ascending such a slope, but distance me to that slope. The grade is measured by tion and not by its sine, so that a grade w sponds to an angle of inclination of but perpendicular, as is commonly supposed. line the elevation would amount to 250 fe one foot for every four feet traveled horizo to a 33 1-3 per cent. grade, one in two until a 100 per cent. grade is reached, wh 45 degree angle.

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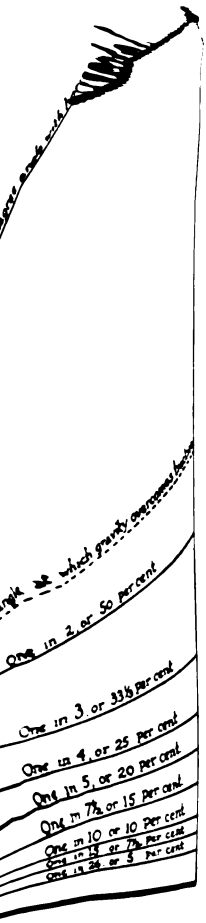

GRADE PERCENTAGES.

represents a line 1,000 fee
oad having a rise that brings
d as 125 feet in a thousand
se for every eight feet, bu
ually traveled by a car is
horizontally with reference
ent of the angle of inclina
resents 100 per cent. corre
es, and not 90 degrees, or
per end of the next slopin
is equivalent to a rise of
So one in three corresponds
er cent. grade, and so on
ted, is the equivalent of a

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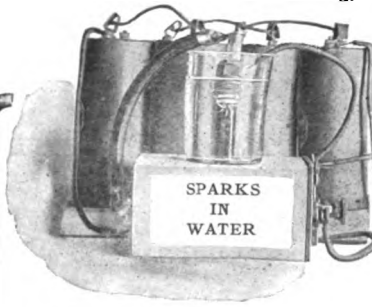

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a gasoline engine cylinder, for soo
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INFALLIBILITY.

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point is a hair-like platinum wir
entirely protected from corrosiv
action in the cylinder by being bake
in and brought flush with the surfac
of the porcelain. The spark in leav
ing this minute point is concentrate
and intensified to such a degree as t
instantly d stroy any deposit on c
near the point by its intense heat an
scouring action produced by strikir
the surface of the insulator.

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Oct. 24-31.....—New York C
Show, Auton
Manufacture
Oct. 26.....—New Haven,
mobile Show,
Nov. 2-9.....—New York Ci
Show, Associ
Nov. 9-16.....—Philadelphia,
Automobile T
Nov. 16-23.....—Baltimore, T
Dealers' Asso
Nov. 29-Dec. 6.....—Chicago, Casin
Andrews, secr
Nov. 30-Dec. 7.....—Chicago, Colise
Automobile S
National Asso
Dec. ——.....—Detroit, River
Association. (
Dec. 14-21.....—St. Louis, Mo.,
Automobile Ma
Dec. 28-Jan. 4.....—New York City,
Mabley, secreta
Feb. 3-8, 1908.....—Buffalo, Conver
men's Show, a
manager, 760 M
Feb. 10-15.....—Detroit, Light G
Goods Associatio
Feb. 20-Mar. 7.....—New York City,
Boat and Sports
Mar. ——.....—Boston, Mechanic
mobile Dealers' A
Mar. 9-14.....—Buffalo, Conventi
mobile Club of B
Mar. 21-28.....—Toronto, Canada,
Jaffray, manager.
Apr. 5-12.....—Montreal, Canada,
man's Show. R.

Races,

Oct. 21.....—St. Louis, Mo., In
Prize, Aero Club o
Nov. 15-16.....—Newark, N. J., 24-
Jersey.

FO

Nov. 11-23.....—London, Olympia
Nov. 12-Dec. 1.....—Paris, Exposition De
nade des Invalides,
Nov. 22-30.....—London, Agricultural
Dec. 5-22.....—Berlin, Germany, A
Dec. 21-Jan. 2.....—Brussels Automobile
Jan. 18-Feb. 2, 1908.—Turin, Italy, Fifth I
Fine Arts, Valentino
Mar. 21-28.....—London, Cordingley's

Races, Hi

Oct. 20.....—France, Gaillon Hill C
Nov. 1-15.....—France, Voiturette C
May 16, 1908.....—Sicily, Targa Florio, A
June 20-July 5.....—Grand Prix, Dieppe (
date to be announced.
July 14, 1908.....—Paris to London, Aeri
August, 1908.....—France, Coupe de la Pre
to be announced.)

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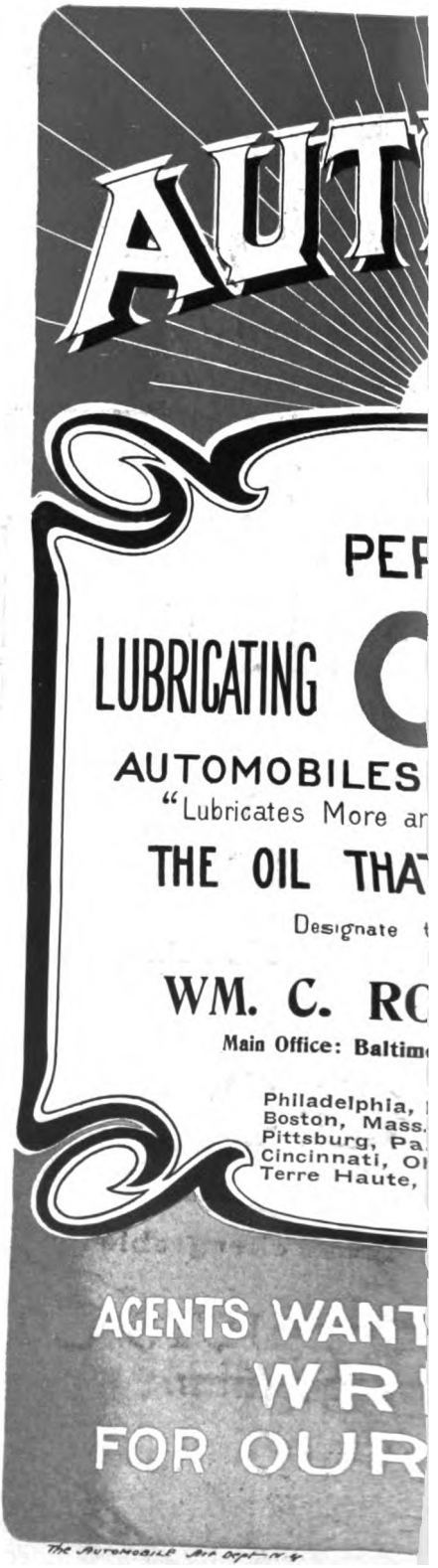

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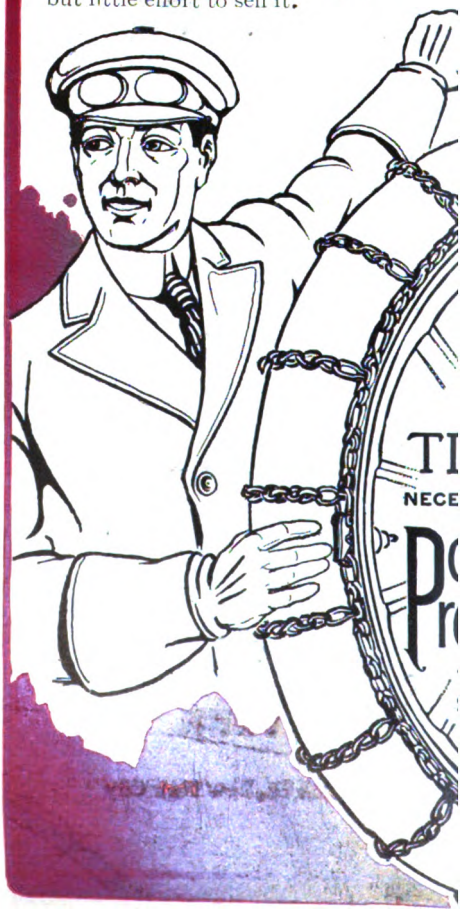

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